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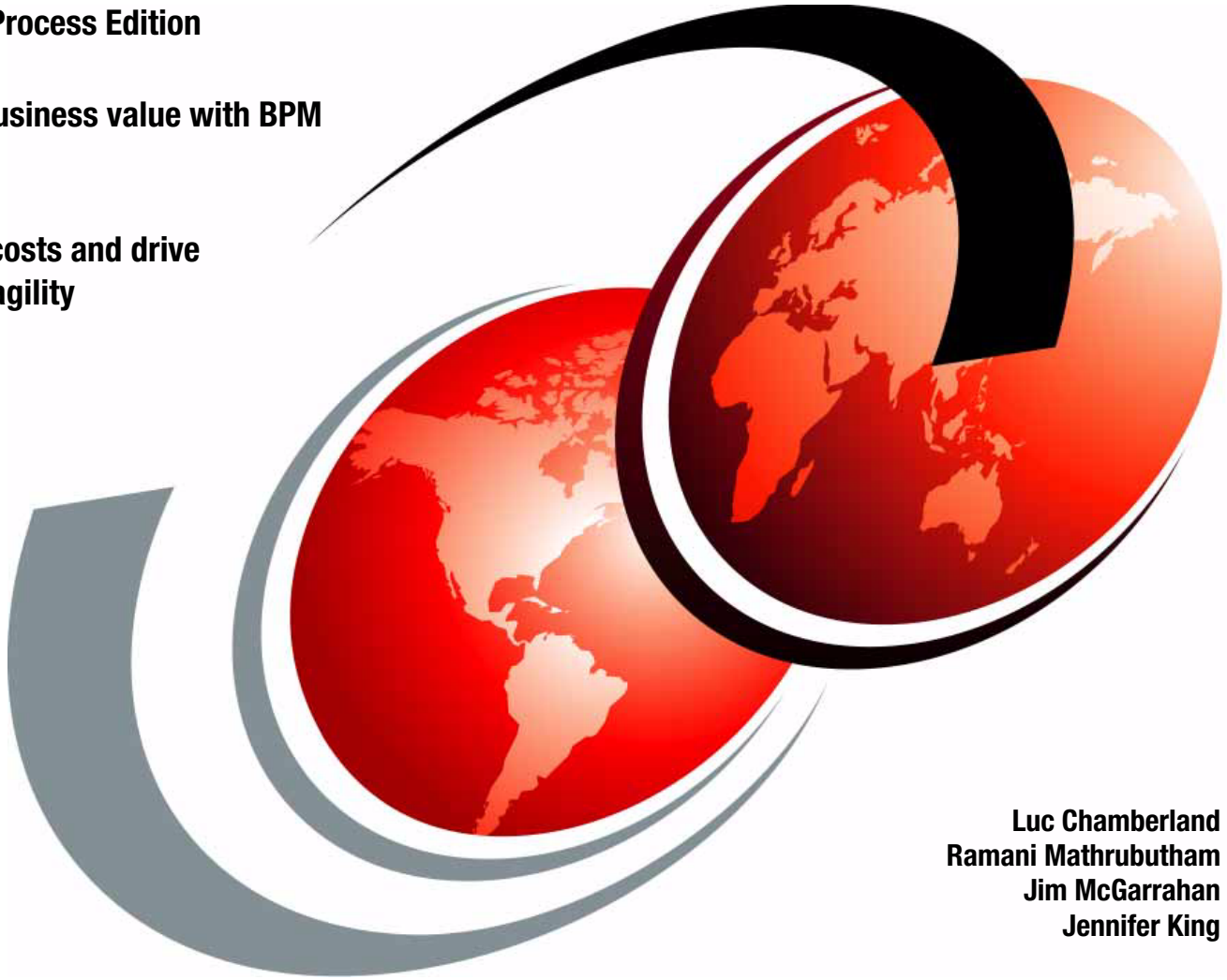
IBM Business Process Management Reviewer's Guide

- Work smarter with IBM WebSphere Dynamic Process Edition
- Achieve business value with BPM
- Optimize costs and drive business agility



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IBM Business Process Management Reviewer's Guide

May 2009

REDP-4433-01

Note: Before using this information and the product it supports, read the information in “Notices” on page vii.

Second Edition (May 2009)

This edition applies to IBM WebSphere Dynamic Process Edition Version 6.2 and its offerings, including IBM WebSphere Business Modeler, IBM WebSphere Business Services Fabric, IBM WebSphere Business Monitor, and all subsequent releases and modifications until otherwise indicated in new editions.

Contents

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Preface

Market demand for business process management (BPM) has grown significantly in recent years and shows no sign of abating. Based on consultations with our clients, a set of capabilities that IBM® makes available enables you to build robust and holistic BPM solutions, whether they are integration-centric, human-centric, or content-centric.

In this IBM Redpaper™ publication, we provide an overview of the IBM BPM portfolio to BPM market watchers who have a keen interest in understanding the most current BPM technology releases and how they can be used together. Specifically, we review WebSphere Dynamic Process Edition, including the following key benefits and capabilities:

- Role-based business spaces
- IBM WebSphere® Business Modeler
- IBM WebSphere Integration Developer
- IBM WebSphere Process Server
- IBM WebSphere Business Monitor
- IBM WebSphere Business Services Fabric

For more information about the IBM strategy to provide innovative technology in the BPM marketplace, go to the IBM Web site:

http://www.ibm.com/software/info/bpm/

The team that wrote this paper

This paper was produced by a team of specialists from around the world working with the International Technical Support Organization, Rochester Center.

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The authors want to give special thanks to Laura Gardash (IBM Canada), our editor, for her guidance and assistance.

Thanks to the authors of the previous edition of this paper.

- Authors of the first edition, IBM Business Process Management Reviewer's Guide, published in June 2008, were:

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Summary of changes

This section describes the technical changes made in this edition of the paper and in previous editions. This edition can also include minor corrections and editorial changes that are not identified.

Summary of Changes
for IBM Business Process Management Reviewer's Guide
as created or updated on May 18, 2009.

May 2009, Second Edition

This revision reflects the addition, deletion, or modification of new and changed information described below.

New information

- WebSphere Dynamic Process Edition

Updated information

- Key products in the IBM BPM portfolio have been updated to reflect current product information, including:
  - WebSphere Business Modeler
  - WebSphere Business Monitor
  - WebSphere Process Server
  - WebSphere Integration Developer
  - WebSphere Business Services Fabric

1

Charting the BPM vision

IBM understands today's business climate and challenges, and provides a holistic business process management (BPM) vision and portfolio of capabilities so that businesses can embrace the reality of the Smarter Planet.

This chapter discusses the BPM vision and provides an overview of the IBM BPM portfolio.

1.1 Building a smarter planet with BPM

Dramatic increases in computing power are leading to new approaches and smarter solutions in which flexible, intelligent, and dynamic infrastructures can be applied to address current and future opportunities. Businesses can instrument activities so that they can be measured and improved, interconnect across silos, partners, and the broader value chain, and intelligently derive insight from an interconnected world of devices, systems, and businesses. Businesses like these have embraced the smarter planet vision.

BPM provides a path to participating in the smarter planet. BPM manifests itself in numerous ways in business environments. Typical BPM solutions are all around us: supply chain processes for inventory management, self-service portals for managing employee benefits, financial processes for compliance, and call center management reports for service organizations. Whether your business needs to document existing processes, define flexible policy options to handle a broad scope of business situations, facilitate human task flows, or gather operational details about how well the business is running, BPM is there.

As the pace of change and competition accelerates in today's challenging economic climate, enterprises are under tremendous pressure to improve the way they do business. Leaders from around the world are focused more than ever on the economic, social, and environmental changes driven by global integration, where free trade agreements, the Internet, and globalization are simultaneously making the world smaller, flatter, and smarter.

These leaders have articulated the need to deliver products and services faster, raise the quality of what they deliver, rein in costs, grow revenues, have the agility to take advantage of market opportunities, have information on hand to react to unforeseen events, and be able to see long term trends. Business needs to be more agile, flexible, and responsive to market demands. Regardless of how well the enterprise runs, it needs to adapt and improve, or it will be outdone by competitors.

What's the downside of inflexible business models and siloed solutions? Production and service outages, backlogs and process bottlenecks, supply chain disruptions, stock outs, missed service level agreements, ineffective use of staff, poor customer satisfaction, operational reports that provide too little too late, and the list goes on. No one wants to be the next case study on enterprise failure.

By working smart, businesses achieve the agility to succeed. Overcome the restrictions of the past by moving to an agile business model, use Web 2.0 to build interactive ecosystems to meet the situational needs of knowledge workers, build dynamic processes that leverage reusable, service-based components, and embrace the Smart SOA approach that turns applications into reusable services.

1.2 The characteristics of BPM success

The demands on information systems to help the business step up to current challenges are enormous. The enterprise looks to information systems to fulfill requirements that, at times, seem incompatible, and IT leaders have the daunting task of enabling the right IT infrastructure to enable the CEO's vision. Let's consider the key characteristics of a holistic BPM infrastructure.

1.2.1 Choice

Business dynamics change, regardless of how well plans are thought out. But how easy is it to modify an IT solution without a massive IT effort? The choices made today should not limit the choices that need to be made in the future.

Imagine that a bank has implemented a consumer loan approval process wherein the credit verification portion of the process has been outsourced to a third party. During the first six months that the solution has been in production, the bank has been continually unimpressed with the third party's track record of returning consumer credit data. The service level agreement is not being met, which itself was difficult to determine. The bank's confidence in the third party is waning, but the bank does not want its reputation of providing fast customer service to suffer. If the bank chooses a different third party to provide the credit check service, can it switch out vendors with minimal IT costs and no service interruption?

1.2.2 Agility

There are many decisions to make as processes run. The right decision is often influenced by various factors and cannot simply be expressed as a set of conditional if-then-else statements. The business needs to express a dynamic business policy in terms that IT infrastructure can effectively harness, and that the business can manage on the fly as that policy changes.

Imagine that an airline is facing tough competition to keep fares low, manage rising costs, and still make a profit. It establishes a complex pricing policy that determines fares dynamically through various factors and calls to services that are not known until a fare request is issued. Being able to effectively define and simulate this policy before deployment and modify the policy to keep pace with market changes will determine whether the fleet will still be flying in a year.

1.2.3 Flexibility

Invariably, disparate departments in an enterprise often develop and grow their missions and capabilities isolated from other departments. As these departmental silos grow, so do their IT systems, but at some point you realize that there is valuable information that should be shared across departments. Enabling departments to share information reveals business efficiencies (for example, by eliminating the need to enter duplicate data) and provides broader business insight across the organization. But can these disparate systems be enabled to work together without costly and risky rip-and-replace initiatives?

1.2.4 Speed

Business no longer has the luxury of taking years to develop solutions. IT departments require the tools to assemble solutions based on reusable assets, minimal coding, robust integrated test facilities, and a straightforward deploy capability. Heterogeneous environments introduce the additional challenge of integrating various hardware and software platforms, which dare not slow down solution development.

Imagine that the CIO has asked for more detailed cost analysis reports to see how depreciation of the retail inventory affects overall costs. You have four weeks to pull together a prototype. IT architects and developers will need to extend the existing solution to pull in data from inventory ERP systems, modify cost calculations and the report format, and collaborate with subject matter experts from the accounting department to validate that the right

approach is being taken. Can you show a prototype in four weeks? Sometimes, you do not get a second chance.

1.2.5 Skills

To effectively improve business processes, an organization cannot and should not rely solely on IT resources to design, collaborate, improve, build, deploy, and monitor those processes. The line of business (LOB) brings subject matter expertise and domain knowledge into the definition of what the business needs (requirements), why certain needs are prioritized higher than others (business goals), and how those needs are reflected in process definitions (models). The LOB writes the specification for the business solution, whereas IT ensures it is implemented, tested, and deployed on a robust and scalable infrastructure. Striking the right balance across your organization to optimally leverage strengths and experiences across both the IT and LOB departments facilitates the speed and agility that you need to succeed.

The LOB needs to take a much more active role in both defining business processes and seeing the business results in real time so they can react swiftly with business insight. The LOB needs tools that can be easily tailored and used, tools that provide the necessary handoffs and integration points with the IT organization.

Consider the case where a Store Operations Executive for a retail chain, using a business dashboard, is notified that sales in a particular outlet are lagging. Drilling down through the data to identify the root cause, she also notices that there have consistently been low staffing levels at the store. Armed with timely, relevant information, this business leader can take action to ensure that there are better recruiting and retention practices at the store. She also asks human resources to ensure that the sales training process has correct compliance measures in place, and that those measures also be tracked in the business dashboard.

1.3 The IBM BPM Suite

The IBM BPM Suite contains a comprehensive set of role-based capabilities (see Figure 1-1) that enable clients to model, simulate, run, rapidly change, monitor and optimize core business processes. The IBM BPM Suite brings together capabilities from across IBM and includes a choice of two foundational offerings, IBM WebSphere Dynamic Process Edition and IBM FileNet® Active Content Edition, that make it easier for you to get started with BPM. The IBM BPM Suite provides end-to-end process automation to enhance performance, lower costs, reduce cycle times, address regulatory compliance requirements, and make the business easier to manage. Leaders can transform insight into action to take advantage of opportunities and mitigate risks with real-time process visibility.

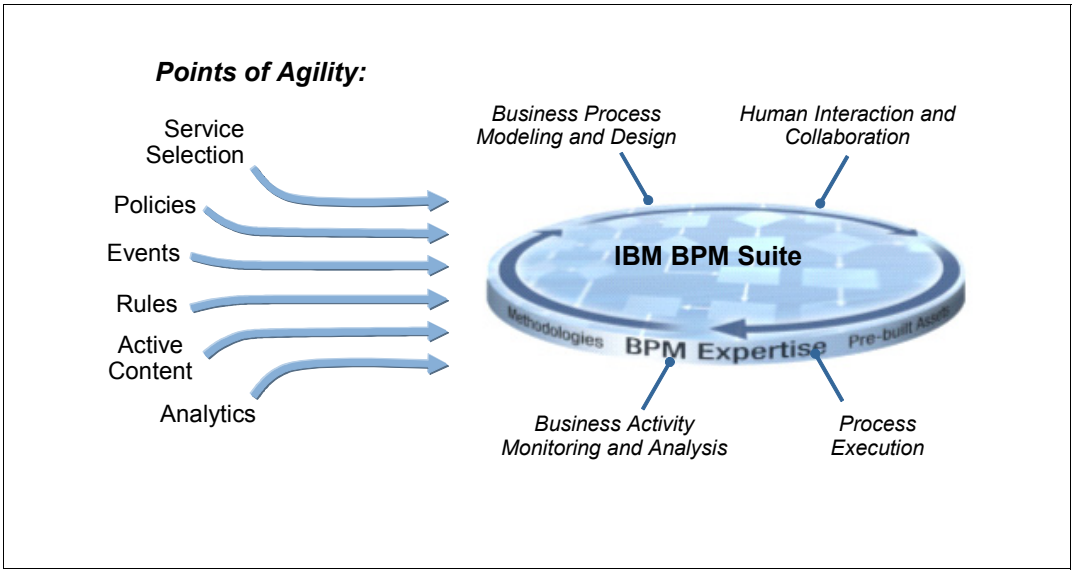

Figure 1-1 The IBM BPM Suite supports points of agility

To rapidly adapt to changing business conditions, the BPM Suite supports the following process agility enablers:

- Events

  Business events occurring from multiple sources (internal or external to the organization), which may initially appear random and non-sequenced, are correlated into actionable event patterns.

- Analytics

  The analysis of information from processes, applications, events, historical data, and other sources to support decision making and improve business performance.

- Rules

  Combinations of procedural logic typically applied to general purpose decisions, assignments, or routing needs.

- Service selection

  Selection of the most appropriate service asset in an service-oriented architecture (SOA) for a given service request.

- Active content

  Content that is logically filed, automatically changed or personalized, initiates corresponding processes, and requests additional content as needed.

- Policies

  Combinations of business-level, declarative statements used to dynamically assemble business functionality into business processes.

WebSphere Dynamic Process Edition provides an integrated set of capabilities that enable your business to quickly build, deploy, and manage robust BPM solutions, supporting the agility enablers.

1.3.1 WebSphere Business Modeler

With WebSphere Business Modeler, a business analyst can fully visualize, understand, document, test, and share business processes. You can simulate process runs to identify bottlenecks and inefficiencies, and define key performance indicators and business metrics for use in WebSphere Business Monitor. Then, you can leverage the real business results in WebSphere Business Modeler simulations for continuous process improvement. In addition, WebSphere Business Modeler can generate IT implementation artifacts for WebSphere Process Server and facilitate testing of human-centric processes in a process server environment.

1.3.2 WebSphere Integration Developer

With WebSphere Integration Developer, you can build SOA-based integration solutions across WebSphere Process Server, WebSphere Enterprise Service Bus (ESB), and WebSphere Adapters. Plus, WebSphere Integration Developer accelerates the adoption of SOA by rendering existing IT assets as service components, encouraging reuse and efficiency. Using drag-and-drop technology and wiring reusable service components together, the integration developer can construct process and integration solutions. Furthermore, the test and debug capabilities of WebSphere Process Server and WebSphere Business Monitor enable you to rapidly prototype BPM and business activity monitoring (BAM) solutions.

1.3.3 WebSphere Process Server

WebSphere Process Server is a high-performance engine that ensures your BPM solutions are enabled through SOA for maximum flexibility, interoperability, scalability, and robustness. First-class support is provided for straight-through processing, human tasks, business rules, and business state machines. The integrated service bus mediates disparate resources for reuse, irrespective of vendor, platform or whether they are home-grown or packaged applications. The sophisticated management tools of WebSphere Process Server enable you to easily see the overall health of your solutions, administer security, start and stop processes, and modify business rules that have already been deployed.

1.3.4 WebSphere Business Monitor

WebSphere Business Monitor is an integrated business activity monitoring (BAM) environment that provides end-to-end visibility of business activity on WebSphere Process Server, WebSphere MQ Workflow, FileNet Business Process Manager, and other enterprise applications. Web-based and portal-based dashboards provide near real-time information so that business leaders can make timely operational and strategic decisions. Fully configurable dashboards show you only what you need to see, and deliver alerts to e-mail, pagers, or PDAs. Monitoring results can be used in WebSphere Business Modeler simulations to complete the BPM feedback cycle, and the WebSphere Business Monitor development toolkit provides templates and a test environment to further accelerate time to value.

1.3.5 WebSphere Business Services Fabric

WebSphere Business Services Fabric simplifies business process assembly and management of composite business applications. By exposing the capability of IT systems as reusable application building blocks, business users can enact rapid business process change using business policies instead of code. Process execution is customized based on preferences and entitlements of recipients. Clients can confidently innovate and respond to

market demands with greater agility and flexibility. Furthermore, dynamic services give you the ability to leverage existing assets (current, third party, and custom) and Industry Content Packs, which contain domain-specific SOA assets that accelerate time to value, simplify interoperability, and ensure compliance with industry standards.

1.3.6 Role-based business spaces

To give users Web-based mashup capability to assess, collaborate, and take action on running the business, role-based business spaces are bundled with the WebSphere Dynamic Process Edition runtime technologies. Using predefined drag-and-drop visual elements and templates, administrators or process owners can rapidly create user interfaces and set granular user-access levels. Business users can customize the look and feel of their own business space, configure the visual elements and alerting mechanisms, and even modify parameters of deployed processes and business applications, all without involving IT. The ability to visually mash up capabilities from various products provides an unrivalled holistic view into your business.

1.4 Unifying focus areas across WebSphere Dynamic Process Edition

The integrated capabilities of WebSphere Dynamic Process Edition enable key BPM value propositions.

1.4.1 Human task support

People are involved in various processes. WebSphere Dynamic Process Edition provides support across the BPM life cycle to enable human tasks. Businesses define human tasks (and any accompanying forms and escalation policies) in their business processes with WebSphere Business Modeler. Developers implement and deploy human tasks with WebSphere Integration Developer, and manage active human tasks with WebSphere Process Server. In WebSphere Business Monitor, business leaders use custom dashboards to monitor and act on human task activities.

1.4.2 Business rules and policy support

Many factors often determine the course of action that is chosen in a process. WebSphere Dynamic Process Edition provides richer support for defining dynamic behavior with business rules and policies. With WebSphere Business Modeler, business analysts define business rules tasks and logic, and then generate IT artifacts that seamlessly integrate with WebSphere Integration Developer for implementation. To keep pace with rule changes in the business environment, WebSphere Process Server provides business space management capabilities to dynamically modify rules and schedules. ILOG extends this rules capability with enterprise-wide business rules management. For rapid policy definition, simulation and management, WebSphere Business Services Fabric enriches the ability to express and bundle policies and offers a view of business policies that is distinct from business processes.

1.4.3 BAM enablement

Business leaders need operational and strategic insight into the business so that they can make well-informed and timely decisions. Business activity occurs on a broad range of systems. A true BAM environment needs to factor in data from broad heterogeneous environments to reflect the big picture. In response, the reach of WebSphere Business Monitor extends to receive events from WebSphere Process Server, WebSphere Message Broker, FileNet Business Process Manager, WebSphere MQ Workflow, and a wide selection of enterprise information systems (EISs) using WebSphere Adapters.

1.4.4 Accelerated time to value

Getting solutions up and running quickly is necessary to respond to business demand and change. The development environments for the IBM BPM portfolio continue to be enhanced to provide more enriched predefined assets, templates, service repository support, code generation capabilities, and overall improved usability. In addition, the tools are synchronized so that the roles can quickly and effectively work together.

1.4.5 Improving business and IT collaboration

BPM is a discipline that brings together business expertise and IT capability. Providing a set of technologies that enables these two areas to collaborate on defining, building, and managing business process solutions unleashes the power of the enterprise to win in the marketplace. Roles in both business and IT are empowered to self-sufficiently make their contributions.

1.5 Building on open standards

Given the heterogeneous nature of many client IT infrastructures, enterprises look for technology that provides maximum flexibility. Industry and technology standards offer open flexibility and safeguard IT investments.

IBM actively participates in several standards bodies (shown in Figure 1-2) pertinent to BPM, and IBM products support numerous standards.

Object Management Group (OMG)	Business Process Modeling Notation (BPMN) Business Process Definition Meta-model (BPDM) Business Process Maturity Model (BPMM) Business Motivation Model (BMM)
Oasis	Service Component Architecture (SCA) Web Services Business Process Execution Language (WS-BPEL) Common Base Event (CBE) Web Services Event Format (WEF) Web Services Notification (WSN) Web Services Distributed Management (WSDM) Web Services Resource Framework (WSRF)
Eclipse	An open development platform comprised of extensible frameworks, tools and runtimes for building, deploying and managing software
W3C	Various Web and XML standards, including XML, XML Schema, XSLT, WSDL, XForms, and WS-Policy
WS▸I	Web service interoperability profiles and testing tools

Figure 1-2 Key standards bodies

IBM also participates in or co-leads standards initiatives for BPEL4People, WS-HumanTask, J2EE™ and event processing.

1.6 Supporting global solutions

As companies internationalize their operations and grow through mergers and acquisitions, the ability to act as one team while operating in multiple languages is critical. IBM BPM products provide national language support and are translated into multiple languages, making the IBM BPM set of technologies truly global in scope.

Imagine having a team in Sydney develop your BPM solution for order tracking, server clusters correlate order events from across the world, regional offices track operational business activity in their native languages, and your headquarters in Madrid examine the impact of order processing on the company's overall strategy. Global companies require global solutions.

As an international company, IBM understands and operates in a global environment. The map in Figure 1-3 highlights the IBM product development laboratories where the BPM products are designed, implemented, and tested. Moreover, IBM BPM service specialists are located in all geographies. From Beijing to Burlingame, IBM is investing in BPM.

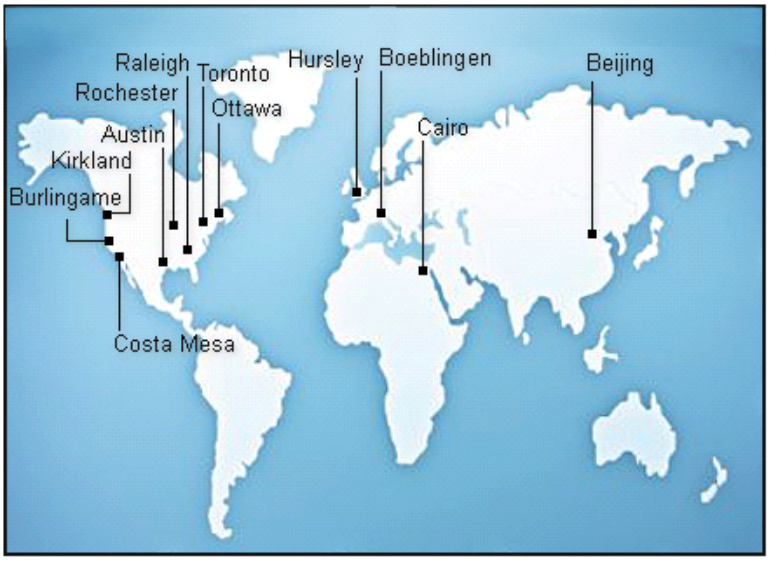

Figure 1-3 IBM development locations

1.7 Summary

WebSphere Dynamic Process Edition demonstrates its full value when harnessed to solve complex integration challenges, bringing the LOB and IT departments together. The complete set of capabilities follows a consistent set of standards and underlying architectures to ensure that business users can effectively represent the business, that developers can properly reflect the business intentions when implementing solutions, and that administrators can easily manage, scale, and administer end-to-end business processes. WebSphere BPM enables you to work smarter.

2

BPM interaction with role-based business spaces

This chapter discusses business process management (BPM) interaction with role-based business spaces. Business spaces help business users perform the tasks:

- Assess, collaborate, and take action on running the business
- Rapidly create and customize user interfaces
- Accelerate development with predefined templates and components
- Set granular user-access levels
- Modify parameters of deployed processes and business applications, without involving IT

2.1 Introduction

An integral aspect of a BPM solution is the ability of various business users to collaborate to capture and drive business process improvements, as well as interact with deployed processes to ensure optimal business performance. Business solution developers, users, and administrators each play a role in defining, executing, or maintaining the business. Business solution developers require a robust set of tools to rapidly build business process solutions. Users need to be empowered to customize and improve their experience and respond to shifting business needs.

Role-based business spaces provide a holistic user interface framework and set of configurable assets, providing first-class integration with the IBM BPM runtime technologies. Business spaces are bundled with WebSphere Process Server, WebSphere Business Monitor, WebSphere Business Modeler Publishing Server, and WebSphere Business Services Fabric.

A browser-based Web 2.0 user interface for business process solutions

2.2 Common user interface infrastructure

Business spaces are browser-based, Web 2.0 user interfaces for business process solutions, enabling business users to interact with their business processes wherever they are. Using a business mashup paradigm, you can combine visual capability and diverse information sources into an integrated user experience. Business spaces deliver pre-integrated visual components, enabling a seamless user experience across the IBM BPM portfolio.

2.2.1 Business space concepts

Business spaces are built on the following foundational concepts:

- Widget

  A single, configurable graphical user interface pane or view. A widget is an embeddable component that can produce and consume events and interact with other widgets. Multiple instances of the same widget can be on the same page, each with a different configuration.

- Page

  A collection of widgets organized by a pre-selected layout of sections, each containing one or more widgets. Widgets are pre-configured to display relevant context for the page, including what information is shown. A business space can generate a URL link to a specific page, which can be provided to other users so that they can more quickly access that page.

- Palette

  A collection of available widgets that can be used to populate the page layout sections, typically through drag-and-drop actions. Widget lists are organized into categories and can be filtered for quick selection. The set of widgets shown reflects the contributing products that have been installed. As more products are installed, more widgets become available.

- Business space

  A collection of pages organized under tabs. The scope of a business space typically represents a view into a BPM solution. Unrelated solutions can be placed in different business spaces. A business space can be created in the following ways:

  – From an empty business space shell
  – Using a pre-configured template
  – Copying an existing business space

You can easily switch between different business spaces that you have access to. Figure 2-1 shows a typical business space.

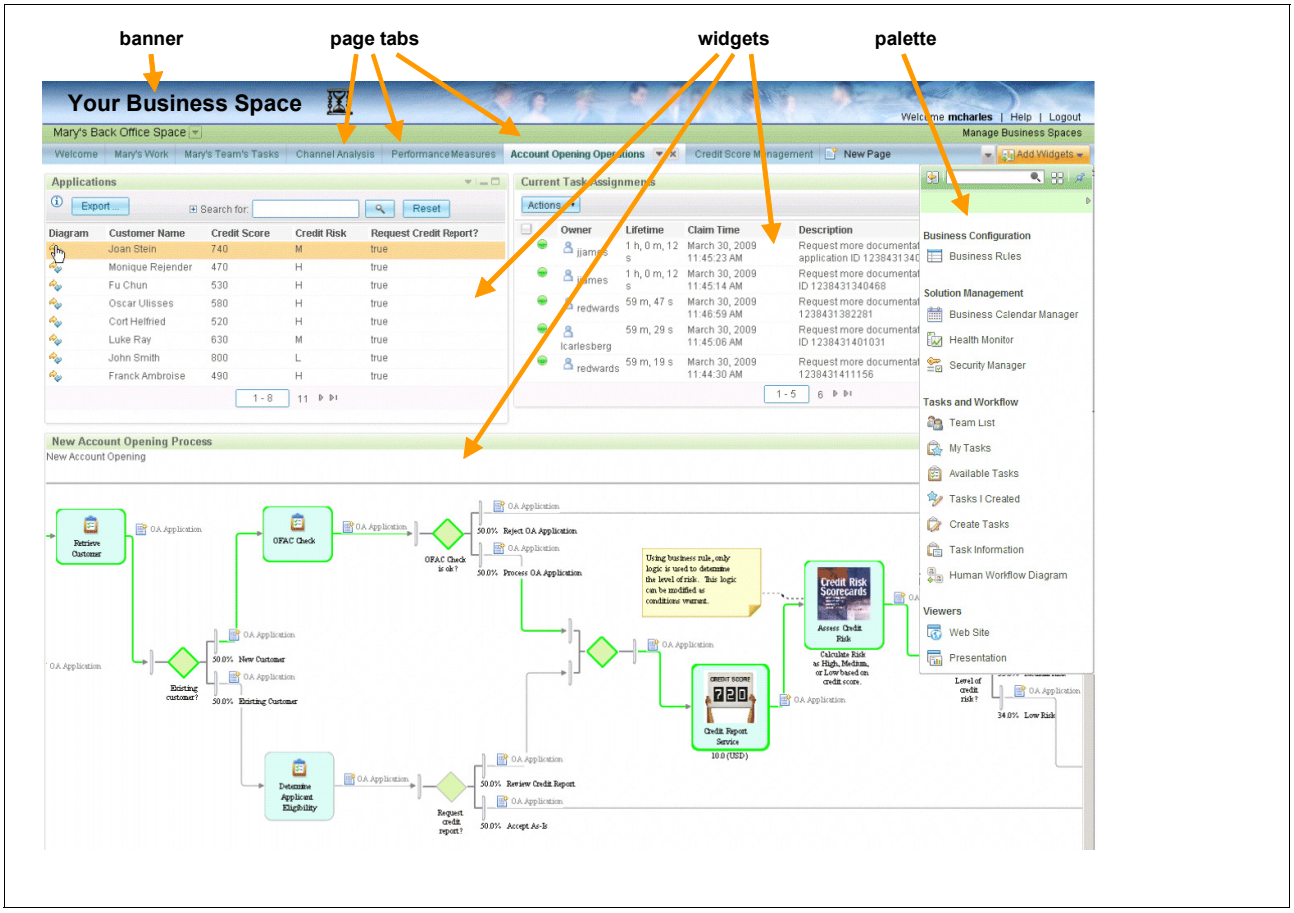

Figure 2-1 A typical business space

2.2.2 Customizing your business space

Users have different solution needs, so they often need the ability to customize the user interface to suit those needs.

The layout or organization of widgets on a page can take one of several patterns (shown in Figure 2-2). You can select the page layout when you create the page, or you can change the layout of an existing page to suit your needs. Widgets can be resized and re-arranged to suit viewing preferences.

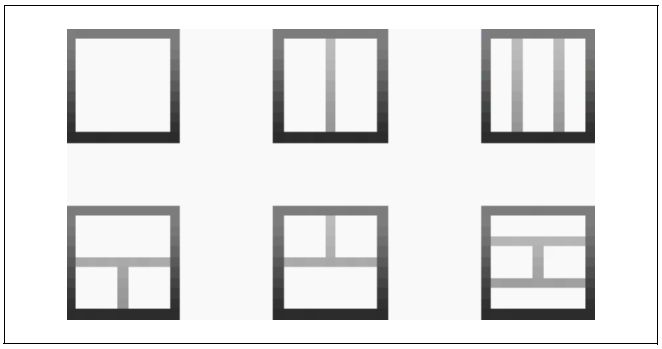

Figure 2-2 The business space page layouts

Dynamically configure variables that affect running processes

You can configure static widget details, such as display details, such as page and widget titles, so that they have more meaning in the context of your solution (shown in Figure 2-3). For example, you can rename the title of the Team List widget to Claims Department and point to specific Web sites, spreadsheets, and presentations. As well, you can dynamically configure variables that affect running processes. For example, an authorized staff member might increase a credit limit business rule variable by 10% to attract more business. These changes directly impact how your business processes run, so it is important to understand ahead of time the impact of such changes and safeguard who can authorize such changes.

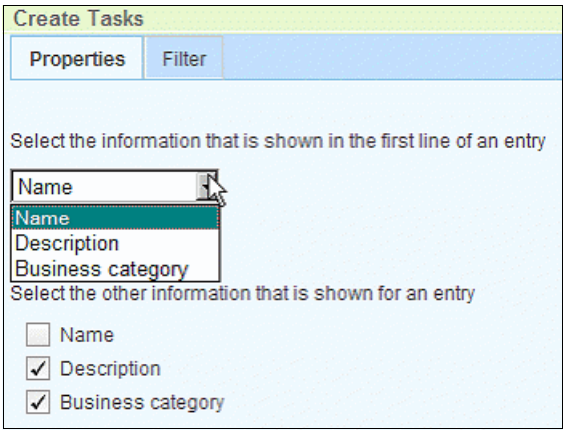

Figure 2-3 Configuration window for the Create Tasks widget

To back up a business space or page configuration, you can export the business space and page definition. This capability is also handy when someone else wants to use a specific business space or page definition, but you do not want to share access to your business space or page.

When information in one widget is related to information in another widget on the same page, widgets can be configured to send and receive information between them, creating a cooperative connection, which is also called a *click-to-action*. For example, selecting an alert (retail order taking too long to fulfill) in the Alerts widget (the source) can highlight a specific process instance (order #24680) in the Instances widget (the target). That same Instances widget can serve as the source for a Diagrams widget, which displays instance-specific diagrammatic details (order stuck in supply chain). You can also define custom cooperative connections.

To provide a custom user interface appearance, you can replace the default theme with organizational logos and other graphics (shown in Figure 2-4). Alternatively, predefined graphical themes are included to help you differentiate your spaces.

Replace the default theme with organizational logos

Figure 2-4 Default and custom logins windows

2.2.3 Space management

Use the Business Space Manager (shown in Figure 2-5) to manage your business spaces, including creating and deleting them, adding pages to them, and setting access controls at the page or business space level. Access to a business space does not necessarily allow access to the constituent pages. For example, a business space owner can set up common pages that all employees can view, other pages that only specific departments can view, and still others with sensitive financial information reserved for executives.

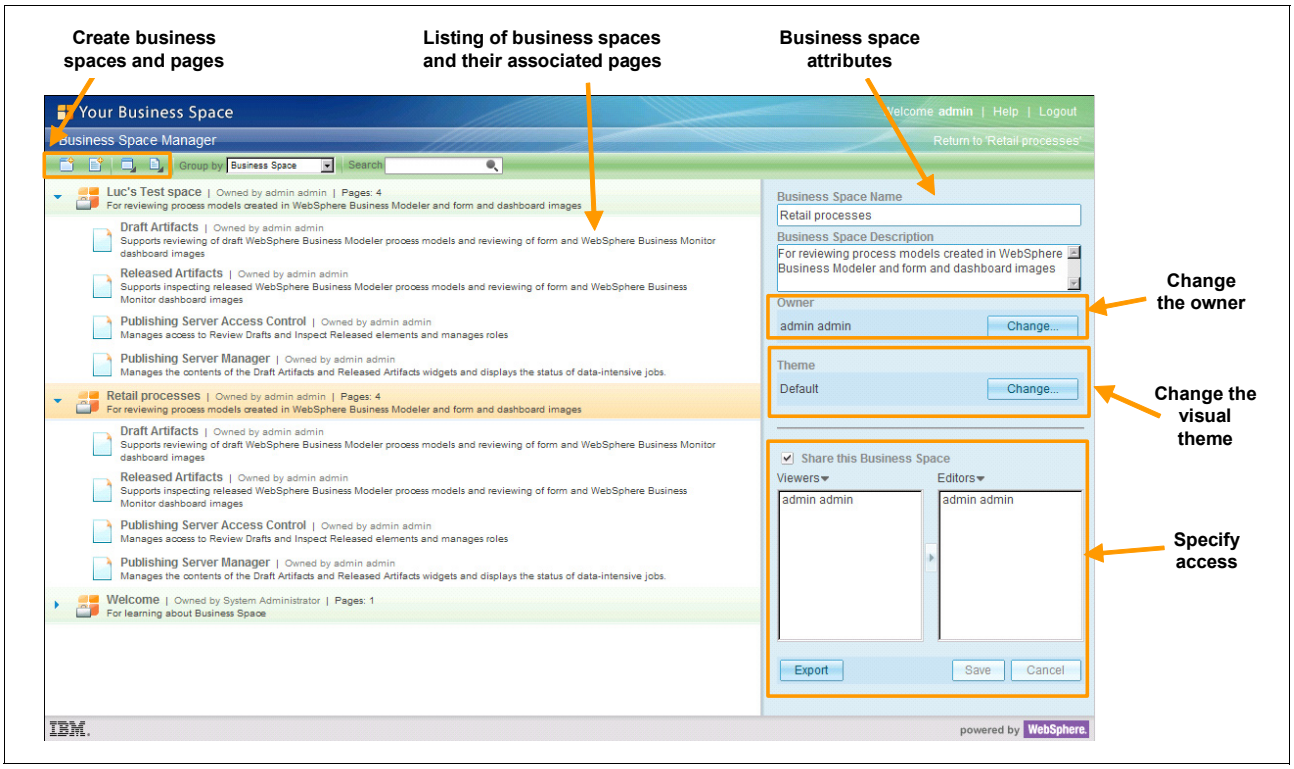

Figure 2-5 Business Space Manager

Users can see the business spaces that they own, as well as business spaces for which they are assigned as a viewer or editor. In this context, role-based access pertains to what can be seen in the business space; access to underlying solution data is managed through role-based access to the runtime components.

There are four levels of access that can be set for a user or group of users, shown in Table 2-1.

Table 2-1 Role-based access to business space

Access level	Permitted actions
Viewer	► Navigates the pages in a business space and sees the widgets on a page
Editor	► Adds, lays out, and modifies pages in a space, including adding, removing, or configuring widgets ► Owns all pages the editor creates, even if the editor is not the owner of the space containing the page ► Performs all Viewer actions
Owner	► Deletes spaces ► Transfers ownership ► Determines who has access to a space and individual pages ► Determines whether users have Viewer or Editor access ► Has Owner access to every page in the space ► Performs all Editor actions

Access level	Permitted actions
Superuser	► Has administrative rights and Owner access to all spaces and pages ► Shares access to a space or page with selected users or all users ► Modifies pages and templates

Access levels can be set on groups, as well as individuals, ensuring that managing access is scalable.

2.3 Accelerate time to value

Although you can define everything about a business space, you will most likely start with some of the predefined assets, which provide direct access to key configurable business solution behavior. In addition, assets are included at the widget, page, and business space level.

2.3.1 Pre-built widgets by product

When you have installed a product that includes business space widgets, those widgets appear on the palette. WebSphere Dynamic Process Edition includes the following sets of widgets, by product.

WebSphere Process Server widgets

Using these widgets, you can create and manage tasks, modify business rule parameters in deployed processes, and manage solutions, as shown in Table 2-2.

Table 2-2 WebSphere Process Server widgets

Icon	Widget	Description
Tasks and workflow		
	Create Tasks	Creates a task to initiate a business process, service, or work for another person
	Tasks I Created	Displays and manage the tasks that you created
	Available Task	Displays all tasks that are not assigned to anyone and that are available for you to work on
	My Tasks	Displays the tasks that you own
	My Team's Tasks	Displays tasks that have been assigned to you or to people on your team
	Task Information	Displays a work area in which human tasks can be acted on. For example, a form can be filled in and submitted here. Also, this area displays information about a task, such as its priority and status.
	Human Workflow Diagram	Illustrates and enables management of the tasks that people perform within a process
	Team List	Displays who is a member of a team and potential owner of available tasks

Icon	Widget	Description
	Send	Creates a task that you can send to another person as a message
Business configuration		
	Business Rules	Displays business rules so that you can change them to dynamically influence the performance of your business
Solution management		
	Business Calendar Manager	Displays timetables and time intervals, which define available times for your business application
	Security Manager	Maps users and groups to system roles and module roles for timetables
	Health Monitor	Presents a snapshot of your overall IT system health, including status of application servers, nodes, clusters, deployment environments, messaging engines and their queues, databases, system applications, and failed events

WebSphere Business Monitor widgets

Using these widgets, you can assess the performance of your business by monitoring individual activities, aggregated metrics, and trends, as shown in Table 2-3.

Table 2-3 WebSphere Business Monitor widgets

Icon	Widget	Description
Business monitoring		
	KPIs	Displays quantifiable status of business measures in various graphical layouts
	Instances	Displays individual instances or user-defined groups of context instances
	Diagrams	Displays a general diagram or instance diagrams associated within a context (requires Adobe® SVG Viewer browser plug-in)
	Alerts	Displays notifications when predefined situations occur
	Reports	Displays business performance reporting data for a time period
	Dimensions	Generates multidimensional reports that analyze different aspects of data retrieved from a dimensional model
	Human tasks	Displays human task instances, which run inside BPEL processes or are stand-alone human tasks
	KPI history and prediction	Displays a history of key performance indicator (KPI) values and predictions for future time periods
Business monitoring tools		
	KPI manager	Use to define, copy, and modify KPIs, view KPI properties, view and create alerts for KPIs, and configure settings for collecting history and prediction data
	Alert manager	Use to subscribe and unsubscribe to alerts and select the type of notification you want to receive when alerts are triggered

Icon	Widget	Description
	Export values	Use to export data for a given time period to an XML file, for use in reporting, analysis, or process model optimization

WebSphere Business Modeler Publishing Server widgets

Using these widgets, you can publish a process for subject matter expert review and approval, or for broad dissemination across your organization, as shown in Table 2-4.

Table 2-4 WebSphere Business Modeler Publishing Server widgets

Icon	Widget	Description
Reviewing		
	Getting Started Publishing Server	Displays help on getting started with the publishing server
	Publishing Server Access Control	Use to manage access to released artifacts and associated elements, and manage roles
	Publishing Server Status	Lists the data-intensive jobs that the publishing server has run, is currently running, and will run
	Draft Artifacts	Use to review draft WebSphere Business Modeler process models, forms, and WebSphere Business Monitor dashboard images
	Comments	Use to add or review comments on various BPM project elements
	Released Artifacts	Displays WebSphere Business Modeler process models, forms, and WebSphere Business Monitor dashboard images that have gone through a review process
	Publishing Server Manager	Use to manage the contents of the Draft and Released Artifacts widget

WebSphere Business Modeler widgets

Using these widgets (discussed in Table 2-5), you can test a business process while it is being developed.

Table 2-5 WebSphere Business Modeler widgets

Icon	Widget	Description
Visualization		
	Process execution	Displays the process diagram that you are testing and highlights the execution path through the process instance being tested to support an interactive process design scenario
	Process execution trace and data values	Displays the name of the completed activity and the output data from the activity as each activity is completed during interactive process design

WebSphere Business Services Fabric widgets

Using these widgets (discussed in Table 2-6), you can view, update, and manage the business services, vocabularies, policies, variables, and rules that contribute to composite business applications.

Table 2-6 WebSphere Business Services Fabric widgets

Icon	Widget	Description
Fabric application development		
	Getting Started with WebSphere Business Services Fabric Authoring	Instructs you how to create and edit applications, business services, and vocabularies
	Business Service Browser	Displays the list of available business services
	Application Browser	Displays the list of available business applications
	Vocabulary Browser	Displays the list of available business vocabularies
	Business Services Details	Displays the details of available business services, which you can edit
	Application Details	Displays the details of business applications, which you can edit
	Vocabulary Details	Displays the details of available business vocabularies, which you can edit
	Business Service Lifecycle Management	Use to manage the administrative aspects of business services, applications, and vocabularies
Business configuration		
	Business Variables	Displays business variables, which you can change to dynamically influence the performance of your business
	Business Policies	Displays business policies, which you can change to dynamically influence the performance of your business
	Application Flow	Displays composite business application flows
	Business Rules	Displays business rules, which you can change to dynamically influence the performance of your business
	Change Set	Displays pending changes, which you can accept or reject

Common widgets

Regardless of which products are installed, business spaces always make a common set of widgets (discussed in Table 2-7) available that provides integration with Web-based and office productivity tools.

Table 2-7 Common widgets

Icon	Widget	Description
Viewers		
	Web site	Displays a Web site
	Presentation	Displays a Microsoft® PowerPoint® presentation
	Spreadsheet	Displays a Microsoft Excel document
	Document	Displays a Microsoft Word document

Icon	Widget	Description
	Web feed	Displays a Web or news feed from an RSS source
Google™ tools		
	Google Calendar™	Displays the Calendar Google Gadget
	Google Gadgets™	Displays a Google Gadget from http://www.google.com/ig/directory

Widgets are implementations of the iWidget standard

If there are specific capabilities that are not supported through the predefined widgets, IT can create custom widgets using Web authoring tools and can write the implementation in various Web technologies, from HTML and JavaScript™ to Flex. Widgets are implementations of the iWidget standard, which leverages open Web formats (such as HTML, XML, and JavaScript). The tools from the Rational® family of products and WebSphere Integration Developer provide an authoring environment (editors) for working with HTML and JavaScript files directly and for packaging that Web content into a Web archive for straightforward deployment.

2.3.2 Pre-built business space templates

To accelerate the creation of a business space, pre-built templates are available, each including pages and widgets that are used in typical BPM scenarios. Because BPM scenarios are both product specific and cross product in nature, the templates include widgets from the various contributing products. For example, the Managing Business Performance template seamlessly integrates widgets from both WebSphere Process Server and WebSphere Business Monitor to enable business measure insights to guide required actions. The available templates are listed in Table 2-8.

Table 2-8 Available templates

Template name	Description
Business Monitoring	Use to create monitoring applications for business processes and to view instances, human tasks, alerts, and key performance indicator trends and predictions. You can also define diagrams and reports to track these events.
Managing Tasks and Workflow	Use to define processes for managing work flows, task information for individuals and groups, team information, and calendar activities.
Managing My Tasks	Use to monitor a business process and create and manage human tasks.
Managing My Team's Tasks	Use to monitor team business activities.
Managing Business Performance	Use to monitor business processes, delegate work, and approve requests, facilitating the collaboration between members in the organization, and negotiate and agree on business decisions. When business problems are reported, you can adjust business policies accordingly.
Reviewing	Use to review draft process models, form, and dashboard images, and disseminate approved process models across your organization.
Initiating Process Improvements	Use to monitor existing business processes and review proposals for improving them.

Template name	Description
Solution Management	Use to monitor the health of your system and to manage timetables.

As the business environment grows its use of business spaces, superusers might choose to create additional custom space templates by converting proven business spaces into templates.

2.4 Summary

Business spaces provide a consolidated user interface for the WebSphere Dynamic Process Edition offering, enabling key business process management scenarios for various business users to effectively collaborate and run the business.

3

Enabling BPM with WebSphere Business Modeler

This chapter discusses enabling business process management (BPM) with WebSphere Business Modeler. WebSphere Business Modeler can help you perform the following tasks:

- Define human-centric business processes, integrated with forms and data
- Start modeling faster using pre-built assets, shared assets, and services
- Simulate, optimize, and test processes before implementing them
- Collaborate as a team to define, review, and share processes
- Generate the baseline for process implementations and a clean handoff to IT

3.1 Introduction

Traditionally, departmental and functional area managers have requested that procedural manuals be defined and disseminated across the enterprise. Defining processes was itself a long, painstaking process. IT assistance was typically required to automate specific numeric-intensive tasks, but the business managed the overall process.

As IT systems evolved, IT departments took on more responsibility for managing various aspects of process definition. In some cases, processes still dominated by manual tasks and paper were orchestrated as workflows. Many IT departments hired business-savvy IT staff who took existing procedural documents and interviewed subject-matter experts to define these workflows.

Improve the collaboration between business and IT

Today, many IT departments continue to manage the definition of business processes, but they realize that they need to improve the collaboration between business and IT. Business processes are best understood by the business, which needs the tools, methodologies, and assets, coupled with its own domain expertise, to define what the current business processes are, and what is required to improve them. The business needs to leverage reusable service assets in process definitions, and review process definitions with a broad team.

In addition to enabling business analysts to define business processes, WebSphere Business Modeler puts powerful process simulation capabilities in the hands of business analysts to assess optimal task flows and resource use. The results of various what-if scenarios can be compared to identify how they fare on task durations, costs, human involvement, resource usage, and other factors. Your business can achieve significant cost savings by determining the best processes to implement before these process specifications are handed over to IT. Thus, the line of business (LOB) plays its rightful critical role in enabling BPM.

3.2 Facilitating modeling for documentation

Business analysts often model their business processes to optimize or implement them. At other times, they model them simply for documentation purposes. In either case, you need to understand where you are before thinking about where you need to go. WebSphere Business Modeler includes a growing set of capabilities that lets you visually highlight the various features of your processes and makes printing and reporting process diagrams and information easier.

3.2.1 Customizable process diagrams

WebSphere Business Modeler provides the flexibility to depict a range of process information visually: from incredibly simple process flows to semantically rich diagrams (Figure 3-1). The modeling modes provide added flexibility to hide or show process complexity and perform constraint checking.

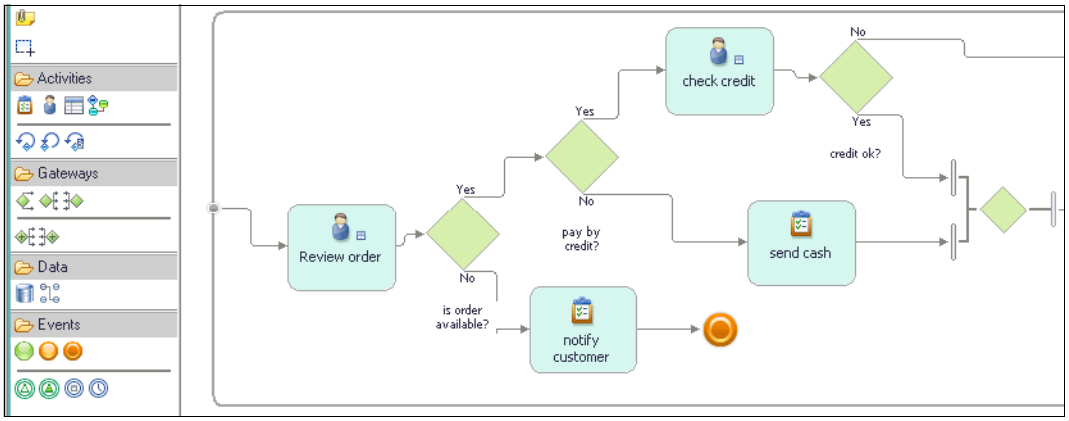

Figure 3-1 WebSphere Business Modeler palette and Process editor

IBM continues to play a leading role in the OMG standard committee in defining BPMN

For standards-compliant process visuals, leverage the Business Process Modeling Notation (BPMN) style process elements. IBM continues to play a leading role in the OMG standards committee in defining BPMN, working with other BPM vendors to achieve consistency in business process notation and semantics. Alternatively, WebSphere Business Modeler users can continue to use the classic notational shapes.

The workflow in Figure 3-1 can be enriched in many different ways. Consolidated diagram display settings can be toggled on or off to display various levels of detail (shown in Figure 3-2), depending on what stage you are at in defining your process and who your audience is. For example, you can more effectively use color by not only coloring process elements by a particular characteristic (for example, by role), but also provide a color legend.

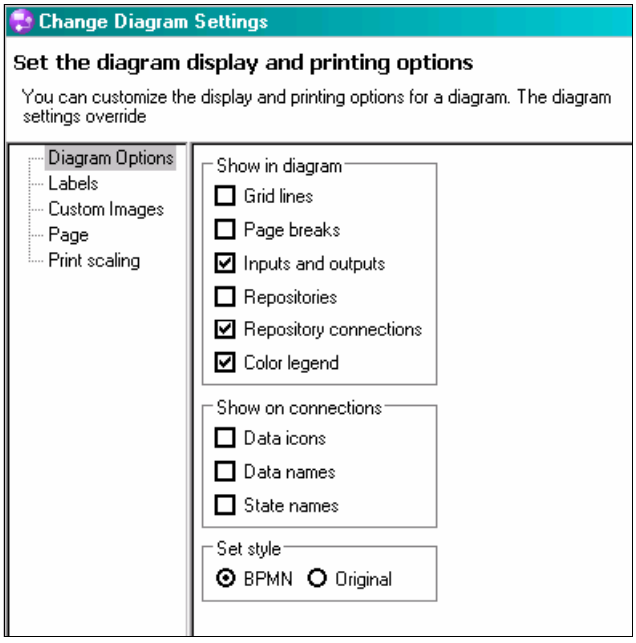

Figure 3-2 Display and print settings

You can change the image shown in a visual element to more accurately reflect your process semantics (shown in Figure 3-3).

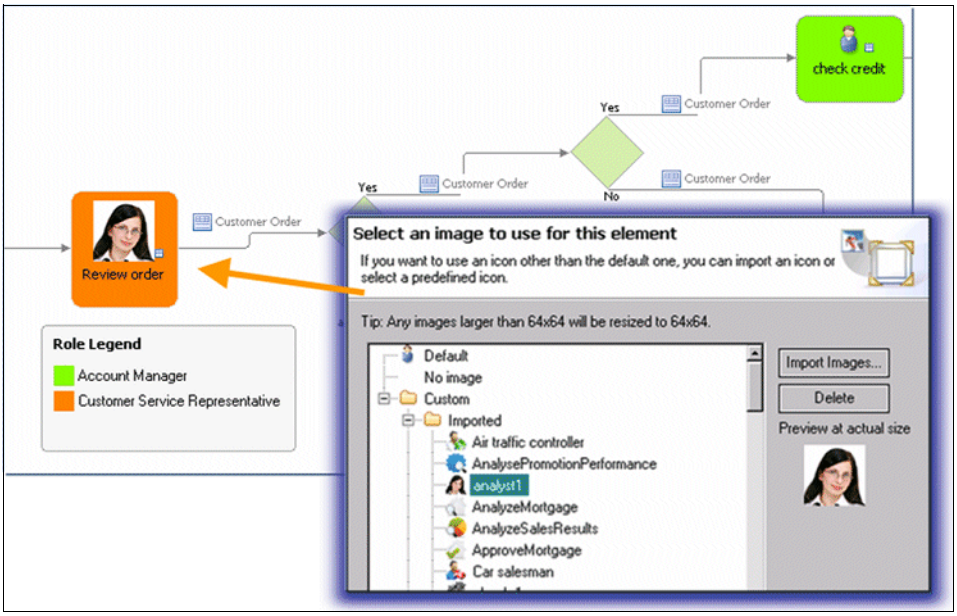

Figure 3-3 Adding an image to display with an element

When viewing process diagrams that include local subprocesses, you can understand the relationship of the parent process to a local subprocess by displaying the subprocess in context (Figure 3-4), simply by opening up the subprocess in place. You can also easily move a process element into a local subprocess or loop, or view a subprocess in a new page.

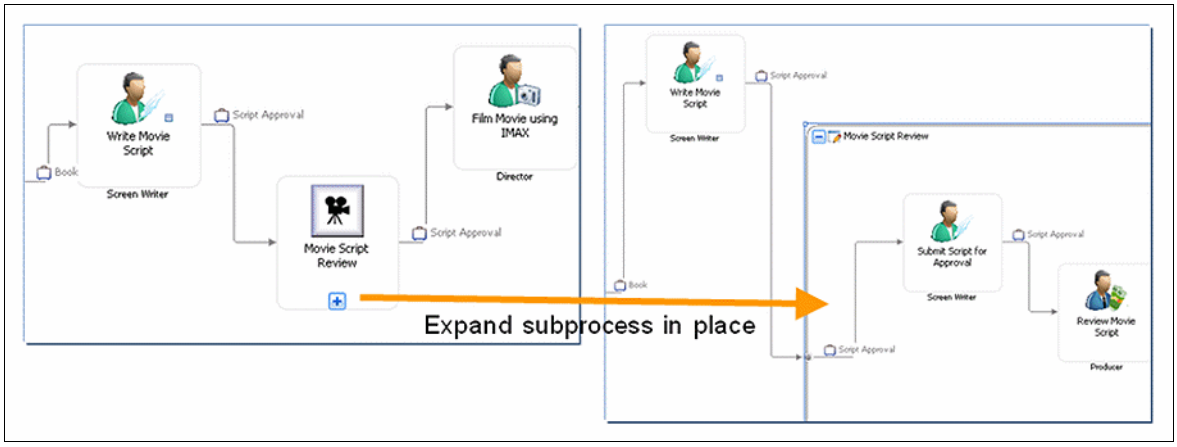

Figure 3-4 Expand subprocess in context

3.2.2 Facilitate printing and reporting

To share model information among the team, business analysts often generate listings of model information, print posters of their models, or generate print-ready versions of their models. WebSphere Business Modeler simplifies the sharing of model information by providing robust printing and reporting features.

When printing with limited space, choose the Compact Diagram option (shown in Figure 3-5) to bring diagram elements closer together (without overcrowding). You'll notice a difference when compared to a diagram that has auto-layout applied to it, which straightens out the diagram but leaves ample room to continue inserting new model elements.

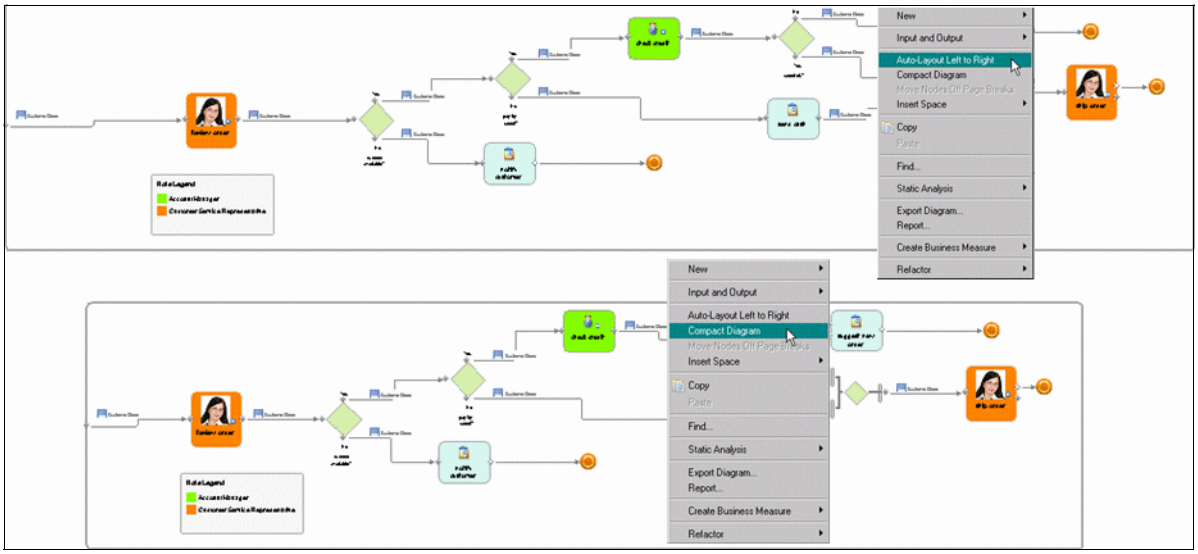

Figure 3-5 Compacting a diagram

Not only can users easily show page breaks and specify that visual elements be automatically moved off of page breaks, but they can automatically have page annotations added to printed report pages to easily locate where a portion of the process diagram picks up in the printed report. The print format (poster, report), paper size, and scaling options that are shown in Figure 3-6 provide the consolidated flexibility to get exactly the required output format.

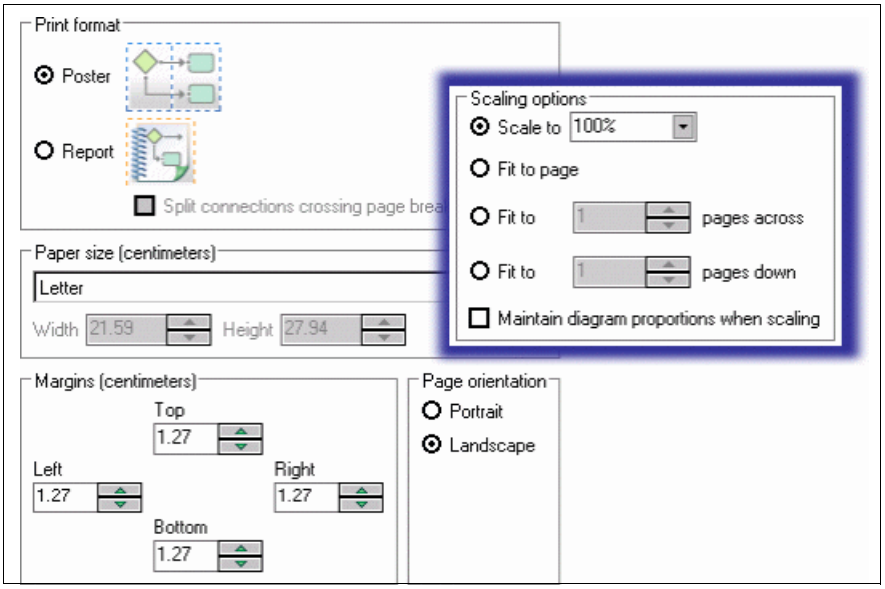

Figure 3-6 Print options

To consolidate the specification of report details, a report template wizard (Figure 3-7) guides users through the process of choosing a report output format, source, and report template so that they can generate and print reports in seconds.

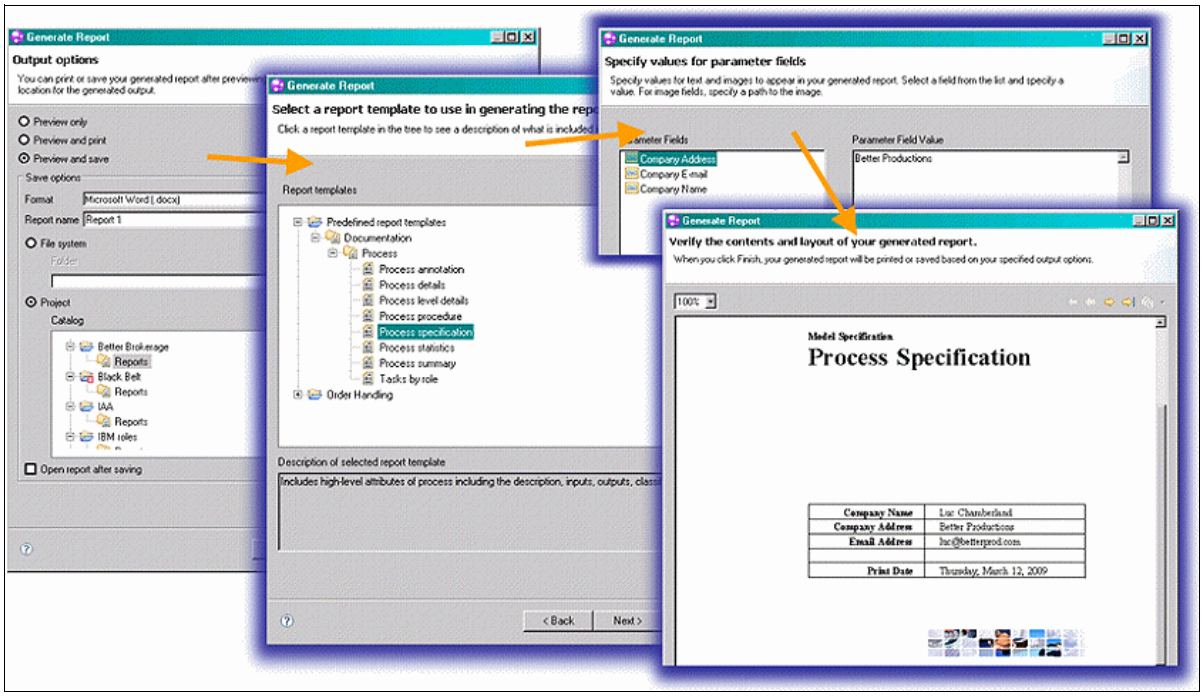

Figure 3-7 Report template wizard

3.3 Growing the role of business

With WebSphere Business Modeler, business analysts have an easy-to-use desktop tool that helps them formalize rigor into the definition of business processes as tasks (including human tasks and business rules tasks), forms, decisions, business items (business-oriented data objects), subprocesses, resources, and repetitive task loops. These elements constitute the foundation for many business processes, and many of them mirror the capabilities provided to IT developers in WebSphere Integration Developer but expose the element characteristics that are relevant to business analysts.

To enable business analysts with additional capability in defining business processes, WebSphere Business Modeler provides enhanced capability to define and simulate human-centric processes.

3.3.1 Human-centric processes and forms

Complex process flows are often a combination of automated tasks and human tasks. In fact, many organizations begin the journey of understanding their manual business processes by defining human workflows. Defining a business process precisely determines how these activities are choreographed and identifies activities for future automation. WebSphere Business Modeler provides first-class support for defining human tasks and the interaction of these tasks with business items and forms.

The relationship between user interfaces, data, and process flows is natural

The relationship between user interfaces, data, and process flows is natural (Figure 3-8), and any of these elements can be used as the starting point for modeling:

- Process approach - First, define the task elements of the process flow, including the human tasks and the connections between them. Then, iteratively begin adding and associating forms, data, and other elements.
- Data approach - First, define the business items. Lay out the process-control flow, and add a data flow by way of business items as task inputs and outputs. Then, generate a structured form from a business item. For example, generate an Invoice form from the attributes of the Invoice business item.
- User interface approach - First, define the form, perhaps by scanning a long-standing paper form that should be rendered electronically, and then converting the PDF document to a Lotus® form. Based on the form, create several human tasks and business service objects that interact with the form. For example, from the Invoice form, generate human tasks for Complete invoice, Review invoice, and Approve invoice.

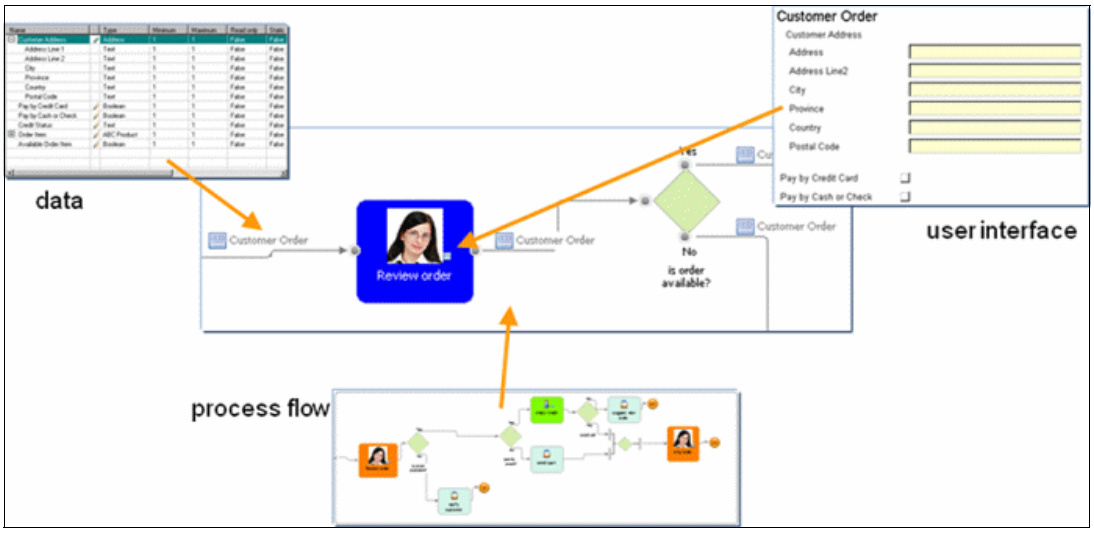

Figure 3-8 A WebSphere Business Modeler model integrates the process flow, data, and user interface

WebSphere Business Modeler provides integrated support for Lotus Forms. You can import an existing form or create one with the integrated Lotus Forms Designer. You can start with the Standard Designer perspective, which gives you all the capability that you need to build simple forms, and then move on to the Advanced Designer perspective to take advantage of complex functions, such as forms data modeling and XPath editing.

Keep your process data and your form user interface in sync

Regardless of your starting point, it is important to keep your process data and your form user interface in sync. If you have an associated business item and form, and the business item is subsequently updated, it is now out of sync with the corresponding form. WebSphere Business Modeler automatically detects this situation and helps you take action to synchronize the process data and form (Figure 3-9).

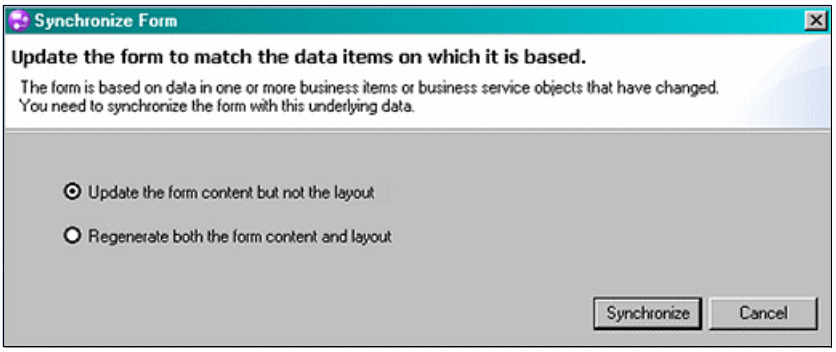

Figure 3-9 The Synchronize Form window

Forms serve not only as the interface to human tasks within a process, but as the interface to the process itself. Associating a form with a process provides a consistent user-initiated mechanism to start a process.

Just as the LOB can save significant time, costs, and effort by leveraging the simulation capabilities of WebSphere Business Modeler to determine the efficiency of process flows, you can also simulate a process storyboard, as seen through a sequence of form preview screens (Figure 3-10). By stepping through the forms that are associated with human tasks, the business analyst gets an early perspective on what the user experience will be.

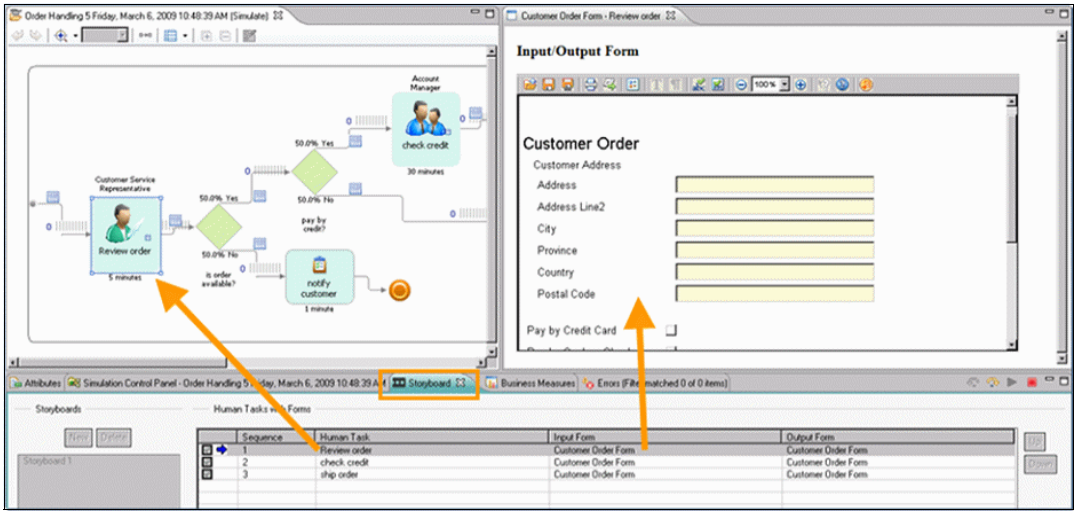

Figure 3-10 Simulating a process storyboard

As you simulate the processing of each human task, the integrated Lotus Forms viewer shows the associated form, and you can interact with that form to ensure that it behaves as expected, without assistance from IT.

3.3.2 Interactive process design

Test user-centric processes in the context of a real test server

Business analysts can also quickly and easily test human-centric processes in the context of a real test server, using interactive process design. After IT (essentially acting as a service provider to the LOB) sets up WebSphere Process Server (and WebSphere Business Monitor, if applicable), business analysts can deploy a process and monitoring solution, without involving IT. When the business analyst

indicates that a process (developed in WebSphere Process Server mode) can be tested on the server (Figure 3-11), the requisite implementation artifacts are generated and deployed to a preconfigured business space.

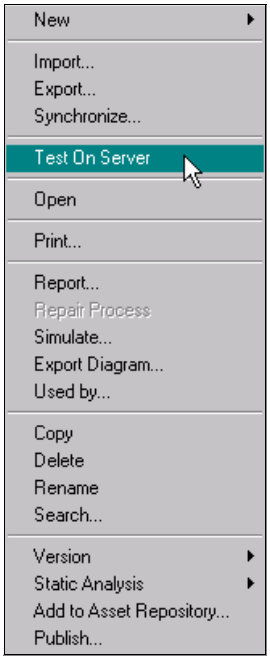

Figure 3-11 Process context menu

The business analyst can then test and evaluate the process and business measures in a test sandbox (shown in Figure 3-12). By empowering the LOB to readily assess the effectiveness of its processes, this powerful capability reduces back-and-forth interactions between the LOB and IT departments and accelerates process deployments.

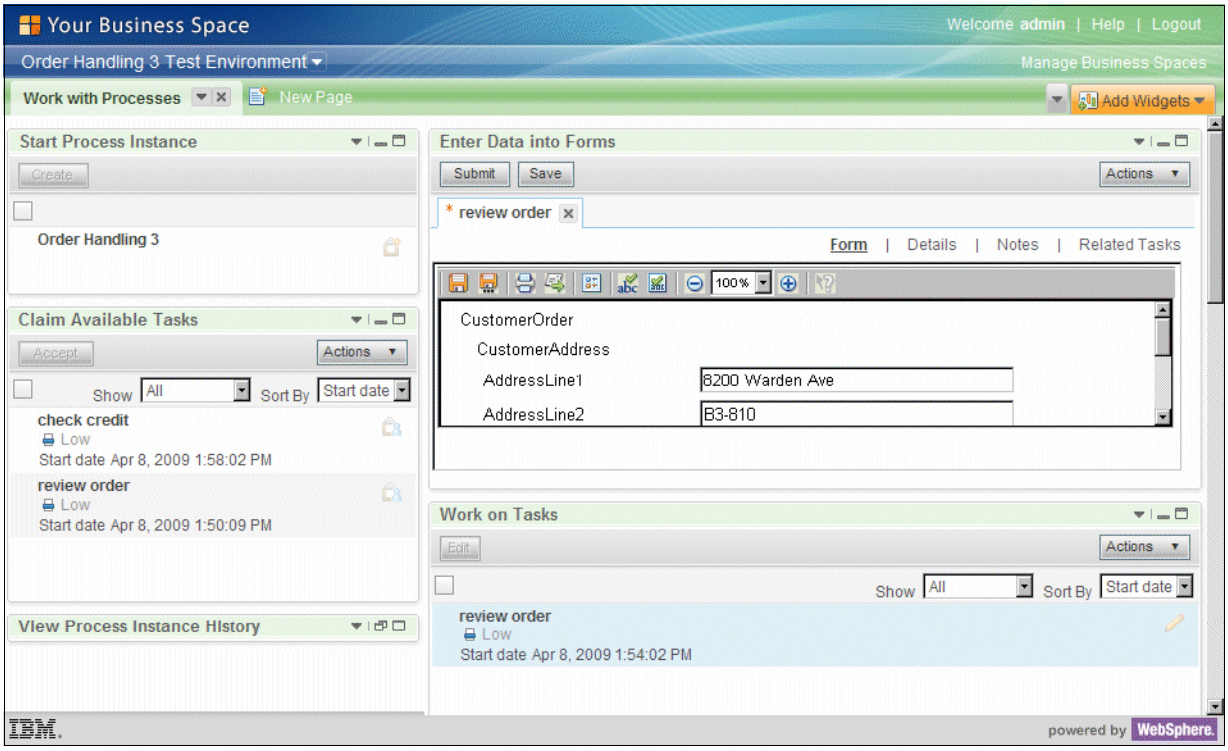

Figure 3-12 Business spaces used for process testing

Assess how deployed business measures change as process instances run

Interactive process design is best suited for human-centric processes, enabling business analysts to log on as one or many roles to test task flow, form interactions, escalations, subprocesses, and business rules. By leveraging the pre-built business measure metric templates in WebSphere Business Modeler, business analysts can also assess how deployed business measures change as process instances run and use business services that reside in a service repository (for example, WebSphere Service Registry and Repository), if that repository is registered with the test server. For services that still need to be implemented as back-end service calls (for example, using adapters to access third-party services), business analysts can temporarily use a human task to ensure that the process task flow is correct. Services that reside in a service repository can be accessed if that repository is registered with the test server.

After logging in to the deployment environment for the test server, an external Web browser opens with the pre-configured business space, which includes many widgets that help business analysts to assess the BPM solution (shown in Figure 3-13) by performing the following tasks:

- Using the Create Tasks widget, which launches process instances of deployed processes, start the process instance.
- Using the Lotus Forms viewer, view, fill in, and submit forms that are associated with human tasks.
- Using the Available Tasks widget, see which tasks the current user can claim.
- Using the Work on Tasks widget, see a list of current tasks that are assigned to you, choose to work on them, or return them.

- Using View Process Instance History widget, view the input and business rules values that were passed to process instances that have already run.
- Using the Change Parameter Value for Business rules widget, view and change the dynamic behavior of specific evaluation activities to assess the impact on process behavior.
- Using the Process Execution widget, see the process diagram and the process execution path as process instances run.
- Using the Process execution trace and data values widget, see a step-by-step trace of each process instance activity, including activity output data values.
- Using the Business Monitoring widgets, see Key Performance Indicators (KPIs), dimensional analysis, alerts showing that the business measures are calculating and displaying correctly (if the process includes business measures targeted for WebSphere Business Monitor).

These business space widgets provide a holistic view of what the business analyst needs to test the process. A production-level deployment environment likely does not contain this broad scope of widgets. Of course, business analysts can remove or add widgets to their test environments.

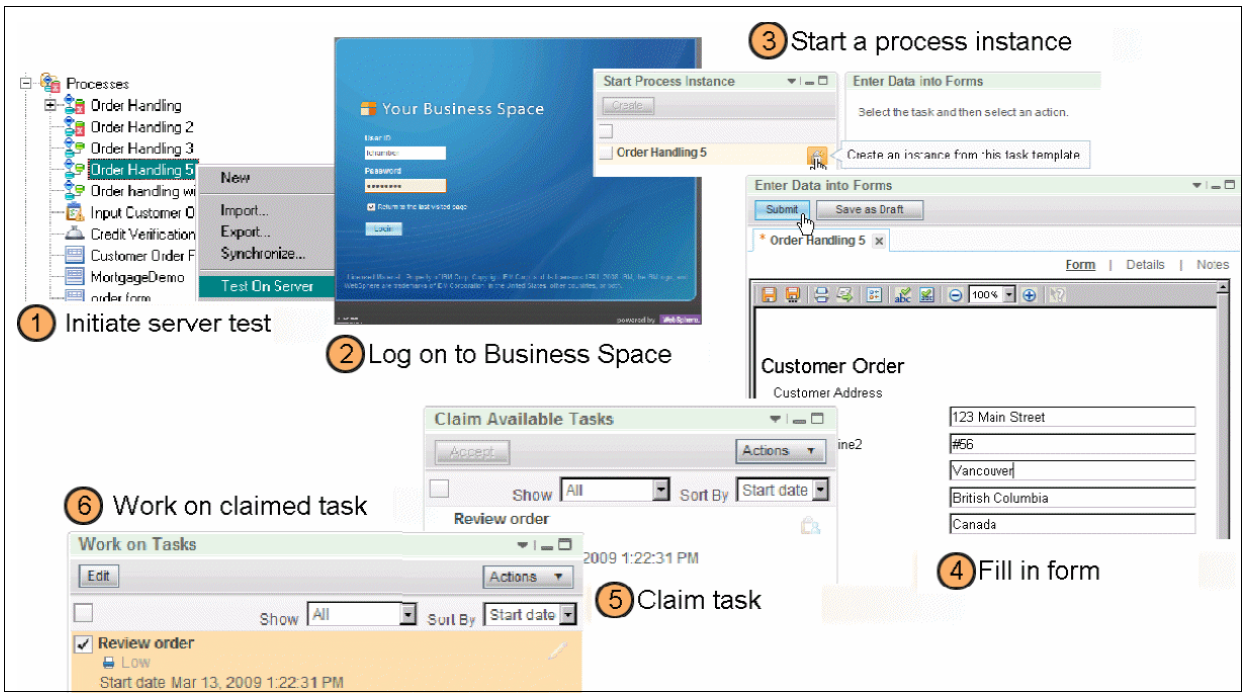

Figure 3-13 Typical activity flow when testing a process with Interactive Process Design

As they iteratively test processes with the interactive process design capability, business analysts might see technical issues arise that are beyond their ability to handle. For example, there might be problems with the test server setup, client configuration, or generated process artifacts. In such cases, business analysts need a quick way of bringing in IT and providing them with the necessary information to perform effective problem determination. Either from within the business space or in a deployment window for WebSphere Business Modeler, the business analyst can select Request Help from IT (shown in Figure 3-14), which generates a ZIP file that IT can import into WebSphere Integration Developer. The ZIP file contains traces, server logs, and the generated implementation artifacts for the process.

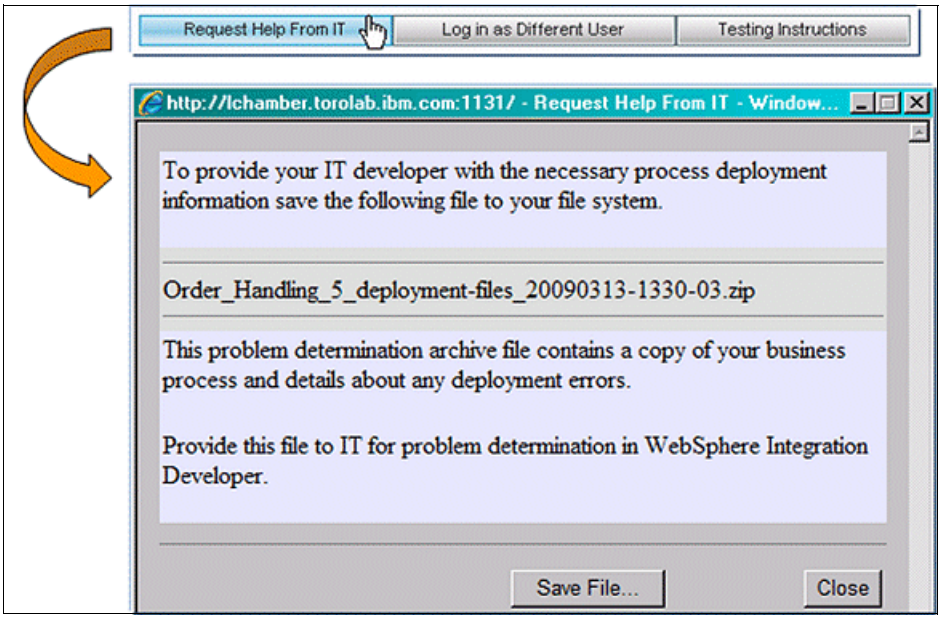

Figure 3-14 Requesting help from IT to resolve deployment issues

3.4 Accelerating time to value

Although WebSphere Business Modeler provides a wealth of capabilities that help you design your new process models, having access to existing assets accelerates time to value. Industry accelerators provide direct industry-specific value for various industries, often aligned with specific industry standards and leveraged by IBM Global Services.

Using predefined assets that are available either directly within the product or that are available from the IBM SOA Business Catalog provides the following benefits:

- Improved time to value by helping solution developers do their jobs more effectively
- Improved time to market by quickly providing relevant solutions
- Reduced development costs by reducing churn on resources
- Contained operating costs by reducing deployment time

The SOA Business Catalog is a comprehensive online resource

3.4.1 SOA Business Catalog

The SOA Business Catalog is a comprehensive, online resource for ready-made business models (or predefined assets) supplied by IBM and IBM Business Partners that have been validated for enablement on IBM SOA products. The catalog holds thousands of assets, including adapters, Web services, process models, and plug-ins that are regularly updated to keep pace with business, technical, and regulatory changes and continually help you build your SOA solutions. Third parties (for example, IBM Business Partners) can register licensed assets in the catalog. The catalog provides an asset overview and details on where to get the asset and accompanying documentation.

To access the SOA Business Catalog, go to this Web page:

http://www.ibm.com/software/brandcatalog/portal/soa

You can search the catalog in many ways (Figure 3-15), including by using the following criteria:

- Asset type (code, data, model, or tools)
- Business need (for example, CRM, ER planning, business integration, or supply chain)
- Industry focus (over 20 industries to choose from)
- IBM SOA foundation product

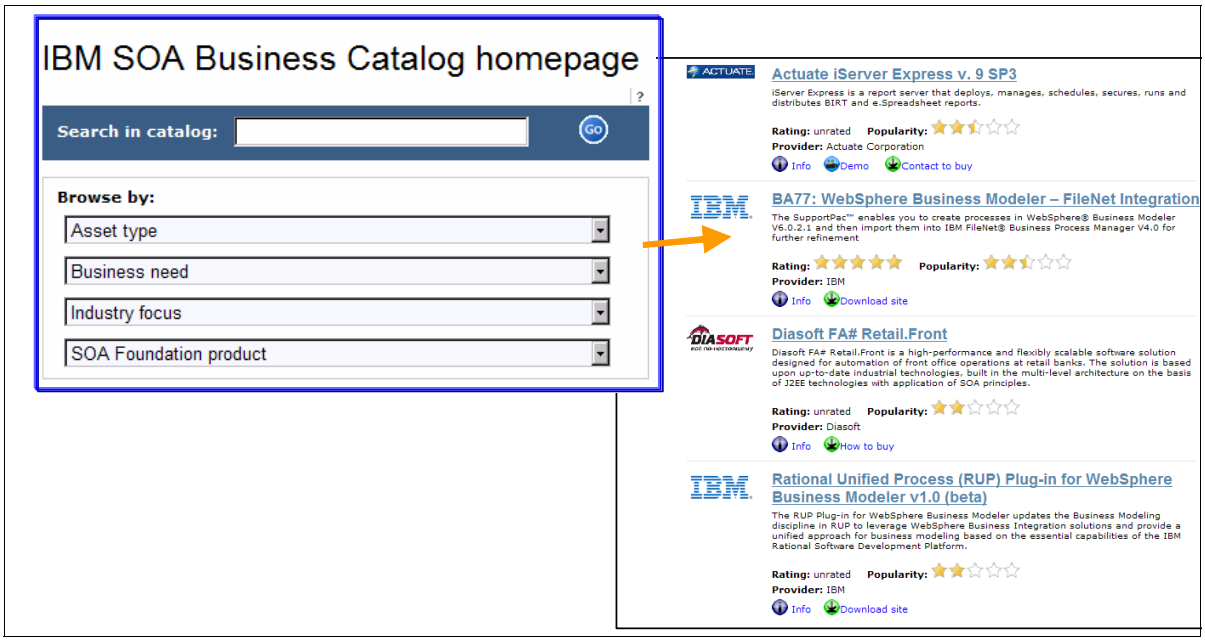

Figure 3-15 IBM SOA Business Catalog

IBM provides assets that are based on a long history of developing domain expertise. For example, assets that are associated with the Information Framework for Financial Markets draw on over 100 person years of modeling and analysis work with the financial services industry. Assets help you with such processes as post-trade processing and reporting, account opening, know-your-customer initiatives, and regulatory compliance, typically reducing analysis time by 40% and significantly accelerating the time that it takes to secure stakeholder approvals.

3.4.2 APQC process classification framework

To jump-start solution development, WebSphere Business Modeler supports a KPI library based on the process classification framework from the APQC, a member-based nonprofit organization that provides benchmarking and best practices to over 500 organizations worldwide. APQC Process Classification Framework (PCF) organizes operating and management processes into 12 enterprise-level categories and more than 1500 processes and associated activities (Figure 3-16).

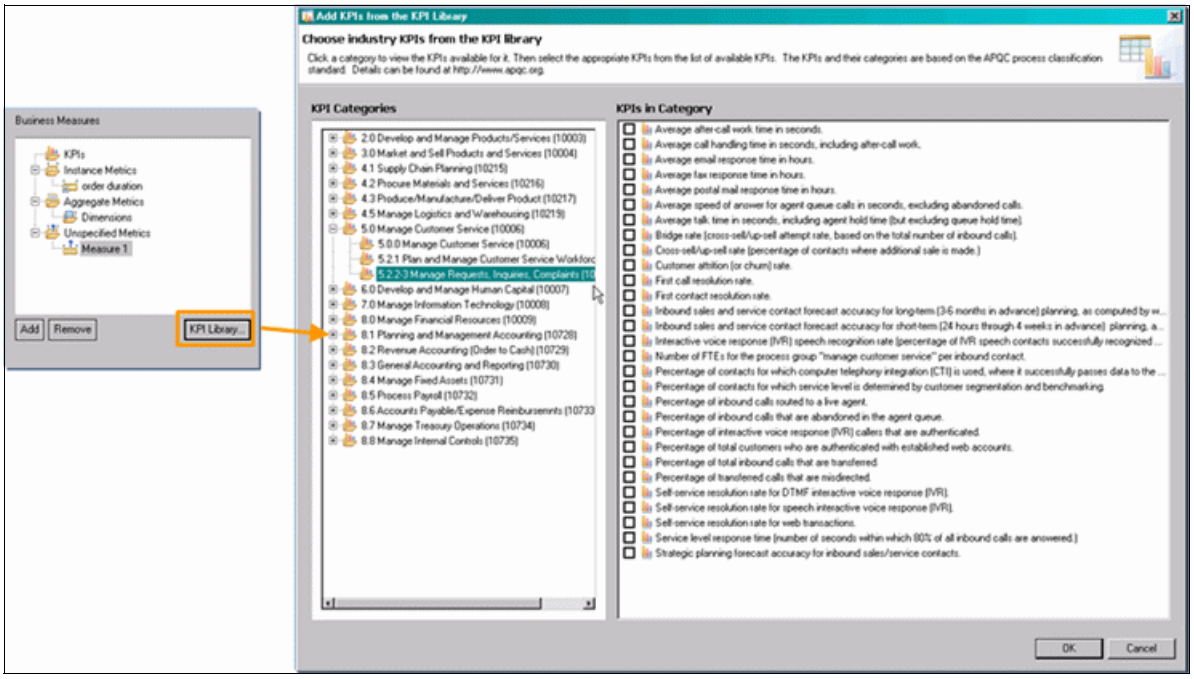

Figure 3-16 KPI library based on APQC classification framework

3.4.3 Growing a repository of assets

As the LOB teams develop various global tasks, business items, roles, and other project resources, the opportunities for reuse grow. And more than simply leveraging existing assets, organizations can mature a business process modeling center of excellence that encourages consistency and best practices, under effective governance policies.

Mature a business process modeling center of excellence

To help foster asset reuse, WebSphere Business Modeler has first-class integration with Rational Asset Manager (shown in Figure 3-17), a repository that enables teams to store approved and completed assets. (In contrast, a team development system, such as Concurrent Versions System (CVS) or Rational ClearCase®, provides a development-time repository for teams that collaborate on projects.) This server-based content management system can be accessed across a broad organization, with appropriate levels of access so that teams can view various sets of assets. You can search through the repository using multiple filters to quickly locate the required assets.

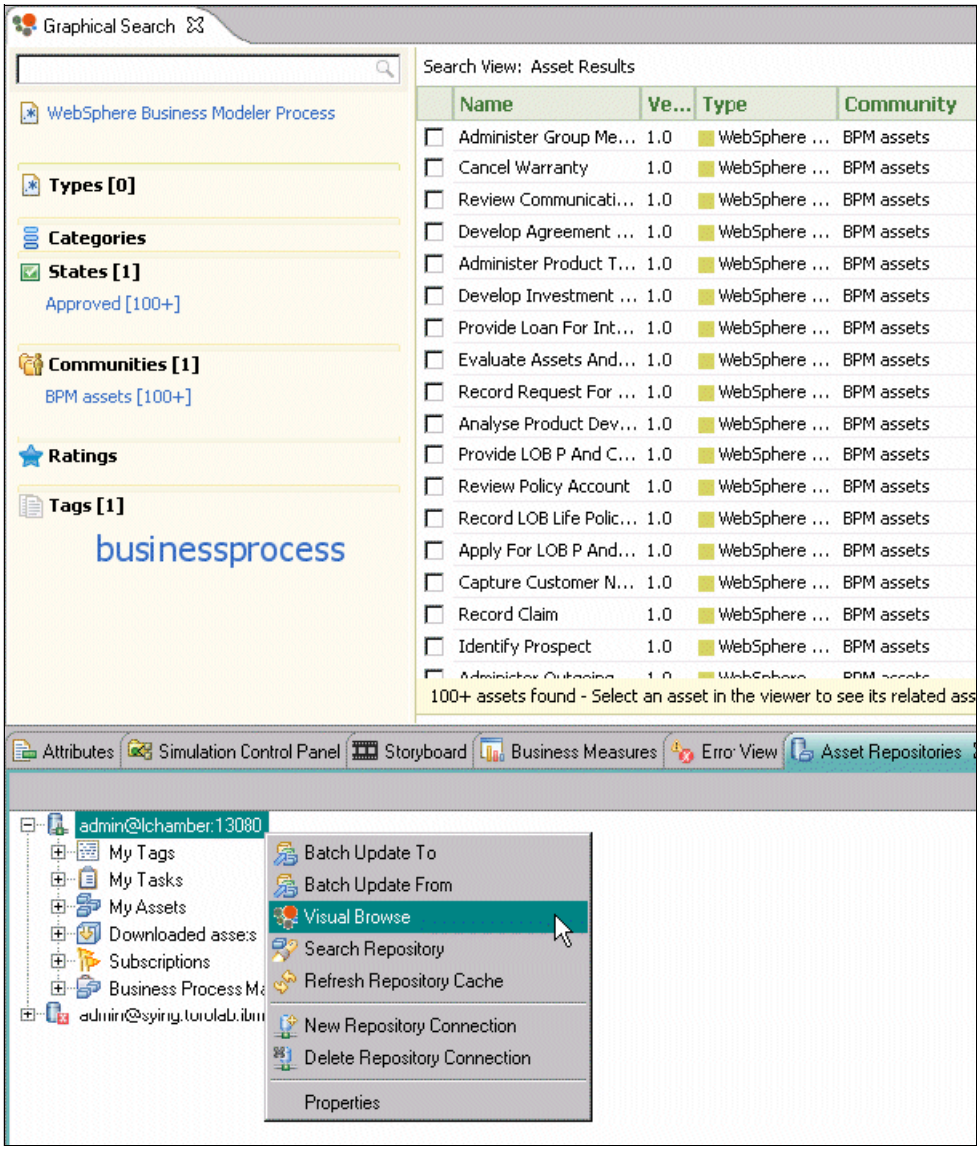

Figure 3-17 Visually browsing Rational Asset Manager

The power of Rational Asset Manager becomes evident through the rich set of metadata details that can be associated with each asset. In addition to the asset name, you can see the version number, contributor details, custom labels, tags, and related assets. As an asset evolves, you can choose to upgrade to a more current version, understand how it is used, and even see how others have rated it.

A rich set of metadata details can be associated with each asset

For a given asset, it is important to understand the relationship that this asset has to both assets that it requires and assets that depend on it (shown in Figure 3-18). Understanding these relationships will influence what related assets you might need to download, as well as help you understand the impact on other assets if you update this asset.

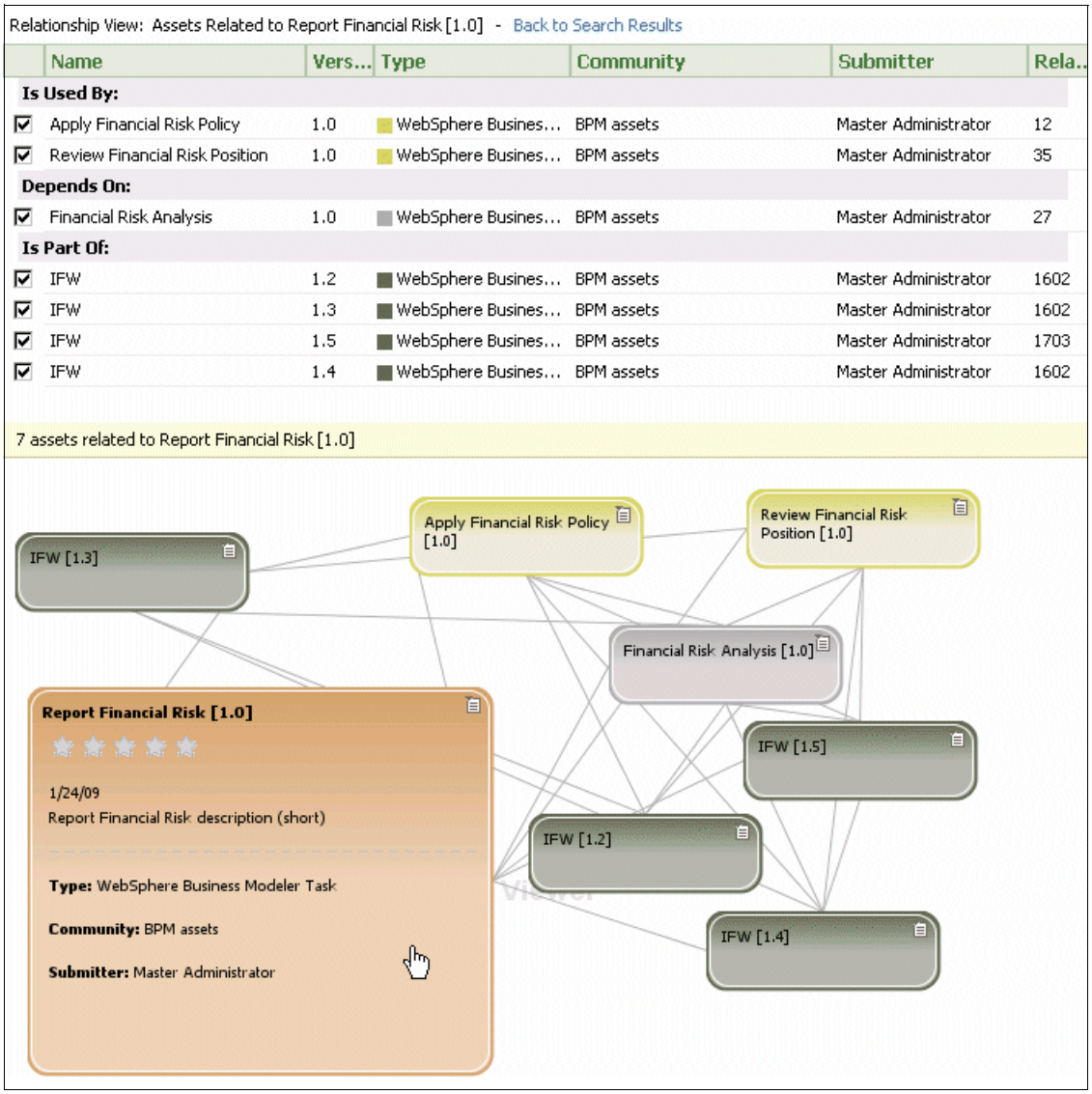

Figure 3-18 Visualizing asset dependencies

The built-in notification mechanism of Rational Asset Manager enables you to subscribe to receive e-mail regarding assets about which you want to be updated. When passing completed process model elements between WebSphere Business Modeler and WebSphere Integration Developer, the integration developer can use this notification mechanism to get alerted to assets that are now ready for implementation. When the business analyst adds new or updated assets to the asset repository, the business analyst can indicate that project interchange files must be generated for WebSphere Integration Developer or WebSphere Business Monitor. In fact, if the integration developer publishes the WebSphere Integration Developer module and the monitor model at the same time, the monitor model will be customized to monitor the Business Process Execution Language (BPEL) process implementation.

3.4.4 Leverage assets defined in WebSphere Business Services Fabric

WebSphere Business Services Fabric enables business analysts to define composite business applications, business services, and business vocabularies to support extensible

solutions that can accommodate changing business conditions. If the target runtime environment is WebSphere Business Services Fabric, being able to leverage existing assets (that had been defined in the business space) in WebSphere Modeler enables business analysts to perform the following tasks:

- Define assets' details.
- Leverage WebSphere Business Modeler capabilities, such as simulation, reporting, and publishing.
- Generate a baseline of implementation artifacts.

With WebSphere Business Modeler, you can import WebSphere Business Services Fabric Repository elements (shown in Figure 3-19), which are represented as existing WebSphere Business Modeler element types:

- A composite business application is imported as one or more global processes.
- A business vocabulary is imported as one or more business items or roles.
- A business service is imported as a service, as well as one global process for each service implementation variation. These global processes are empty but are associated with the service, allowing the business analyst to specify the details of the service capability and enabling the business analyst to define alternate process flows for the different business service variations.

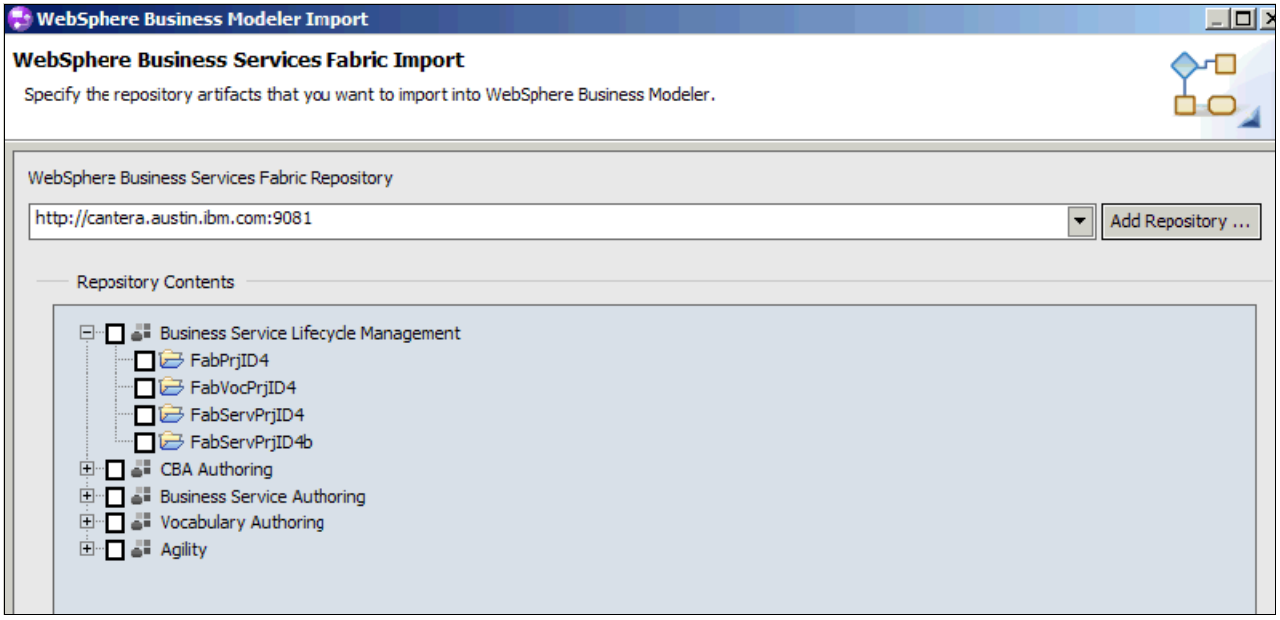

Figure 3-19 Importing WebSphere Business Services Fabric Repository assets

Consider the case when a process model includes a global task or service that always performs the same action, regardless of business context. You can replace this process model element with imported business service extensibility, and modify existing variations and model new ones.

When working with a process model that is targeted for implementation and deployment with WebSphere Business Services Fabric, ensure that you are working in WebSphere Business Services Fabric mode because this mode constrains the type of elements that can be used and ensures that the IT tools can leverage the generated IT artifacts. In addition, a model element can be assigned the Dynamic Assembler implementation type (shown in

Figure 3-20) so that the element is interpreted as a Dynamic Assembler Component in the IT tools.

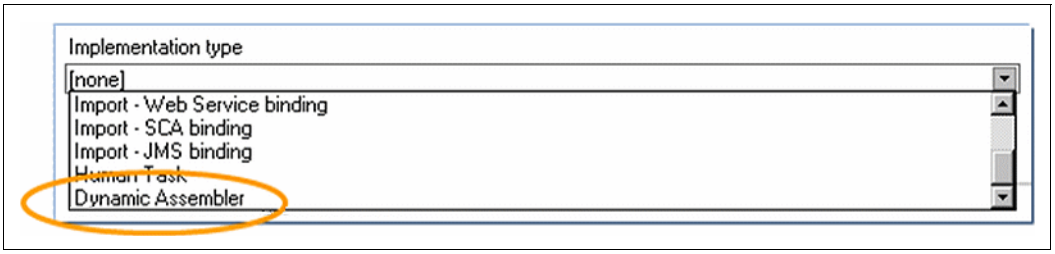

Figure 3-20 Specifying an implementation type of dynamic assembler

3.5 Collaboration

For modeling projects to be successful and to ensure that they effectively factor in the broad organizational expertise for a particular domain, it is critical that teams be able to share process elements and have robust mechanisms for reviewing each other's work. In WebSphere Business Modeler, business analysts can share model project data through import and export facilities, team support (CVS, Rational ClearCase), or by sharing PDF reports. Teams can also collaborate by sharing data across projects, making project data available for viewing and commenting through WebSphere Business Modeler Publishing Server, and taking advantage of Rational ClearCase performance over wide area networks and Web-based views. They can also generate reports in Microsoft Word format.

3.5.1 WebSphere Business Modeler Publishing server and business spaces

With WebSphere Business Modeler Publishing Server, process definitions and other model artifacts can be shared across a broad organization (illustrated in Figure 3-21 on page 41). Business analysts use WebSphere Business Modeler to publish processes (including relevant diagrams, artifacts, and attachments) to the server, enabling subject-matter experts, process implementers, and business analysts to collaborate on the definition of process models. After processes have been reviewed and approved, system-of-record process models can be published for referral across the enterprise intranet and even through a secure extranet with business partners.

Enable subject-matter experts, process implementers, and business analysts to collaborate

Using custom business space widgets for WebSphere Business Modeler Publishing Server, project administrators can grant users and groups access to projects and release artifacts. For draft projects, users add comments about the overall process or about specific process diagram elements (shown in Figure 3-21). Comments have various attributes that enable users and project administrators to categorize, filter, and manage comments: comment type (problem, question, or suggestion), comment priority (high, medium, or low), and comment status (open or closed). This consolidated commenting system enables quicker and more streamlined project reviews. All comments can be exported for use in quality-control records.

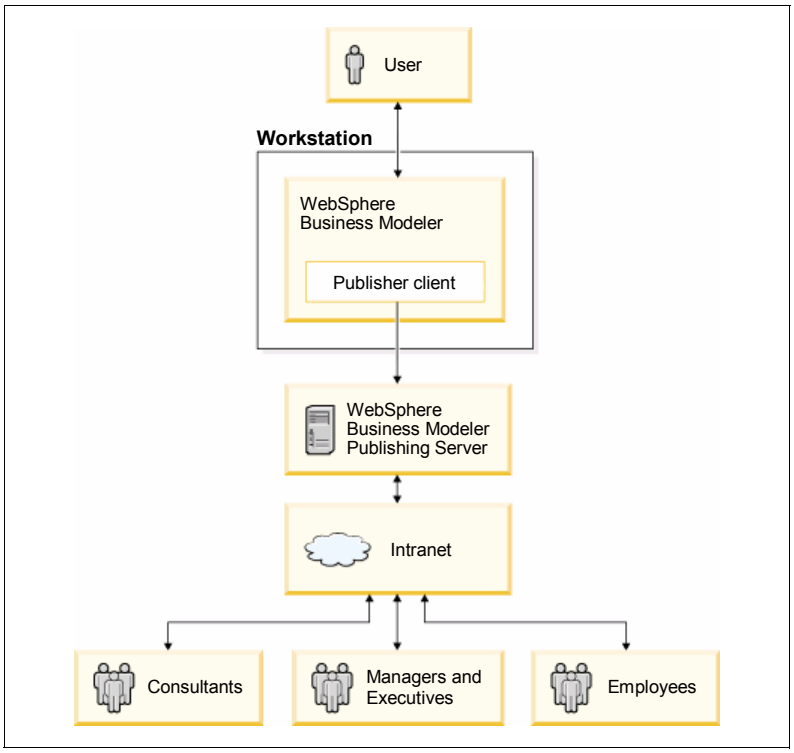

Figure 3-21 User context for WebSphere Business Modeler Publishing Server

Figure 3-22 shows a typical WebSphere Business Modeler Publishing Server interface.

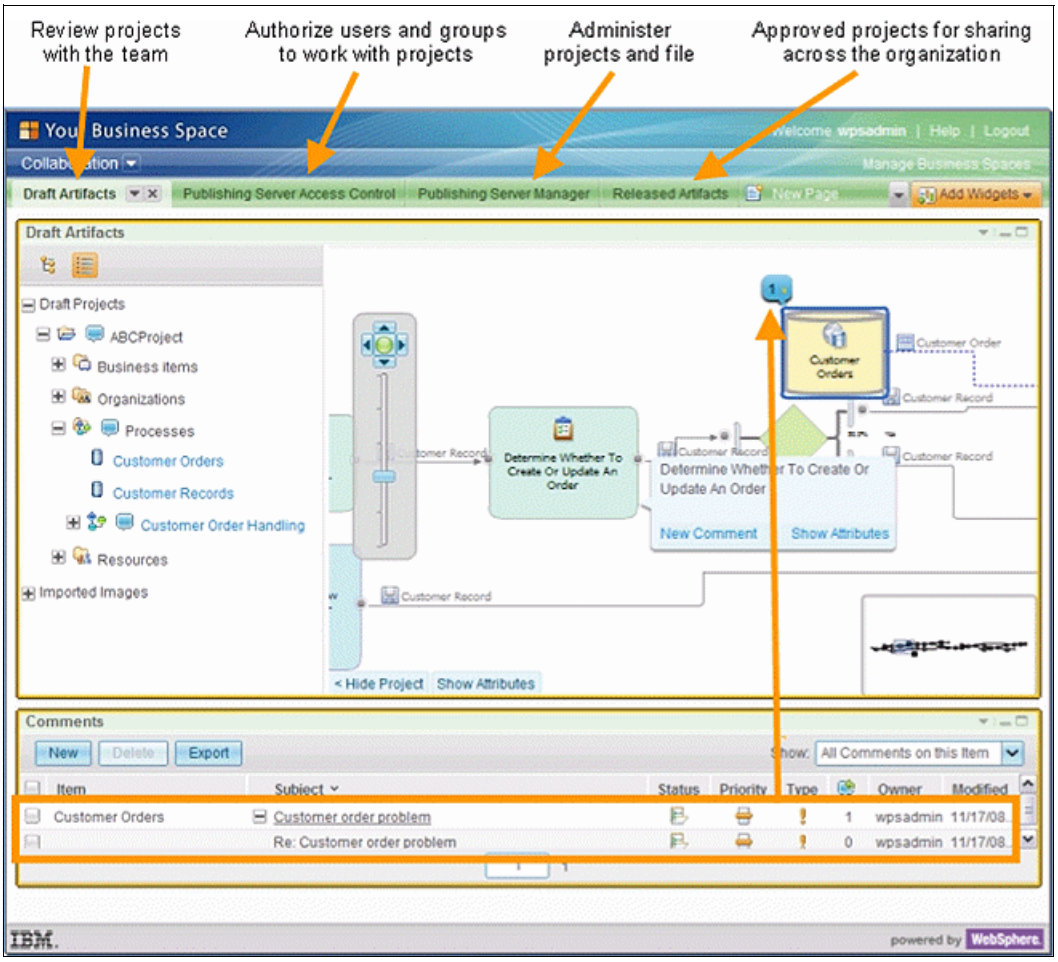

Figure 3-22 Typical WebSphere Business Modeler Publishing Server interface

3.5.2 Leveraging Excel spreadsheets and PowerPoint diagrams

Business users are typically the process subject-matter experts in their organizations, and they often convey their knowledge using office productivity tools with which they are familiar. WebSphere Business Modeler provides import facilities to leverage their insights into formalized process artifacts.

The definition of data structures often begins in spreadsheets. Predefined worksheets (available in multiple languages) provide a prescriptive starting point for entering process data (shown in Figure 3-23). Business analysts can then choose to import as much or as little from the worksheets, or work in stages. The WebSphere Business Modeler import capability defines business items, roles and individuals, organizational units and locations, and tasks.

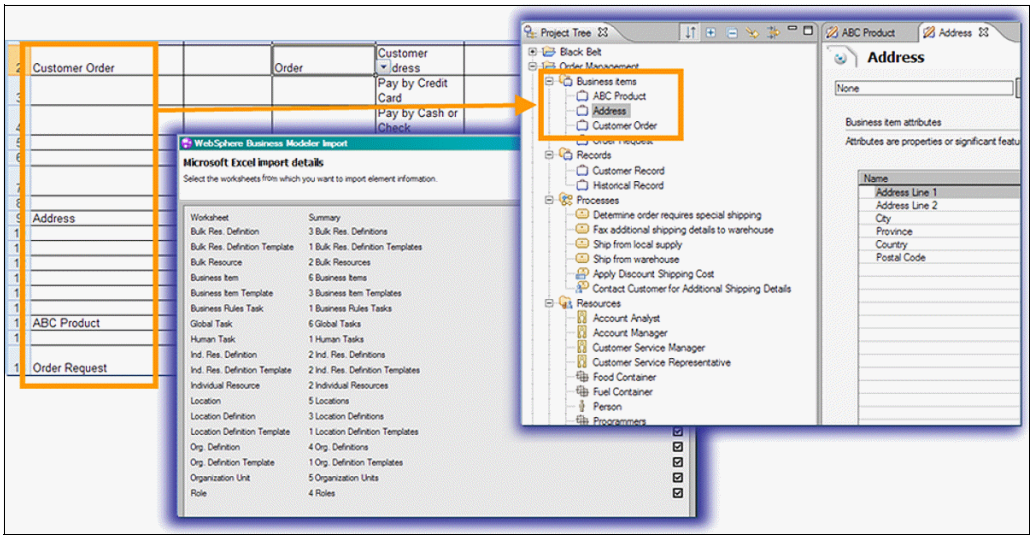

Figure 3-23 Importing structured data from Microsoft Excel®

Business users often use drawing applications to capture initial ideas about their process control flows. WebSphere Business Modeler has long supported the ability to import Visio® diagrams, and it now supports a similar capability to leverage PowerPoint diagrams (illustrated in Figure 3-24). In fact, your organization might have dozens of process slides that can start process modeling projects. Regardless of whether activities move from top to bottom, left to right, diagonally, or any which way, the import capability lets business analysts select a PowerPoint slide, determine how they want to map unrecognized shapes, and then convert the diagram into a WebSphere Business Modeler process. To leverage this capability, download the plug-in from IBM alphaWorks® Web site:

http://www.alphaworks.ibm.com/tech/wbmpptxplugin

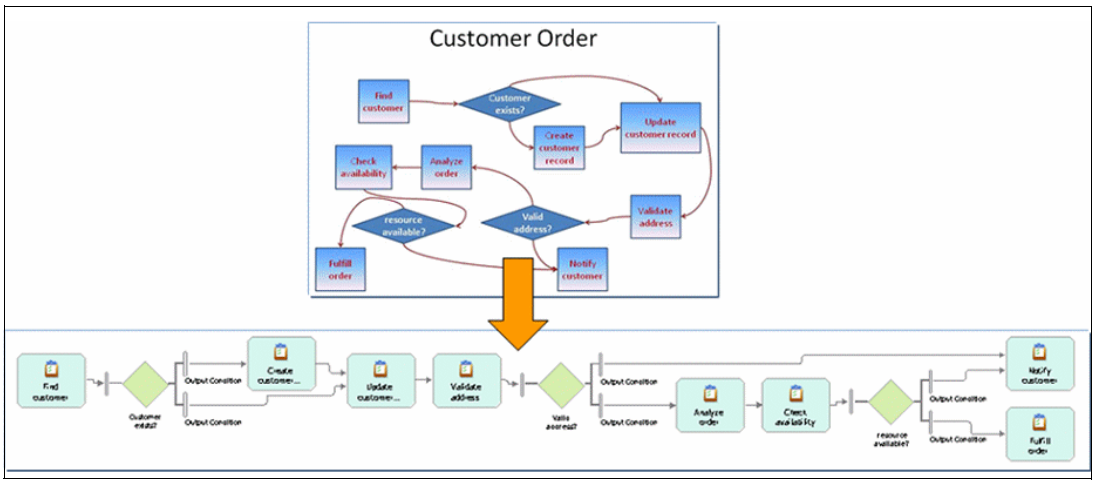

Figure 3-24 Importing a diagram from Microsoft PowerPoint

3.6 Closing the gap between business and IT

Although WebSphere Business Modeler can be effectively leveraged on its own to document and share business processes, its value in a broader BPM context becomes more apparent when it is used with other tools to define and implement business process elements. Various roles across business and IT are typically involved in enabling enterprise-scale projects.

Therefore, the ability to share data between tools becomes critical for smooth transitions between roles.

WebSphere Business Modeler provides a broad range of integration capabilities, supporting the following formats or products: Microsoft Excel, Microsoft Visio, WebSphere MQ Workflow, Web services, XML Schema Definition (XSD), XML, Rational Software Architect (represented in Unified Modeling Language (UML)), Rational Data Architect, Rational RequisitePro®, WebSphere Business Monitor, WebSphere Integration Developer (represented in Business Process Execution Language (BPEL)), WebSphere Service Registry and Repository, and FileNet Business Process Manager.

WebSphere Business Modeler and WebSphere Integration Developer share the capability to define data maps, backwards connections, and exception outputs.

3.6.1 Data maps

As you iteratively develop your process model, you might need to integrate a new service into the model. If the new service has a different interface than what has been passed through the data flow, you need to map the data definitions. A data map element transforms data between source and target to facilitate data flow. WebSphere Integration Developer supports data maps. Therefore, if you are modeling for implementation on WebSphere Process Server, maps defined in WebSphere Business Modeler are preserved. To avoid unnecessary complexity when defining a business model, define complex data maps in WebSphere Integration Developer.

Consider the case in which the first version of an order process includes a local task to check credit. The business analyst later discovers that there is an existing service (which can be imported from WebSphere Service Registry and Repository) that should be leveraged. However, this imported checkCredit service requires different data input and output than is used by the previous and succeeding tasks. Data maps bridge the gap by enabling an existing data structure to be mapped to the interface requirements of the service (shown in Figure 3-25).

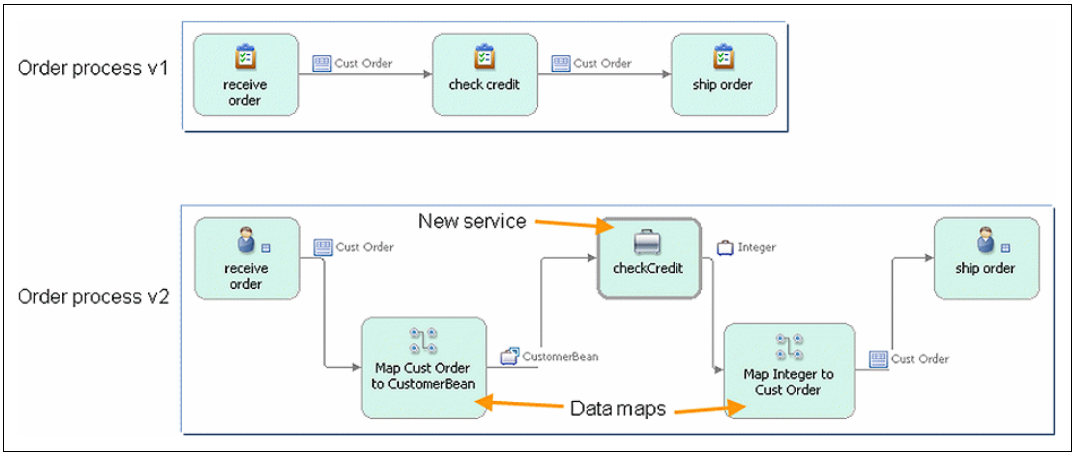

Figure 3-25 Using data maps to interface with a service

The map editor (shown in Figure 3-26) provides a straightforward visual approach to define the mapping: simply connect the attributes between the source and target data objects. This capability not only gives the business analyst added precision to specify data object mappings, but it enables early testing of this process pattern with the Interactive Process Design capability.

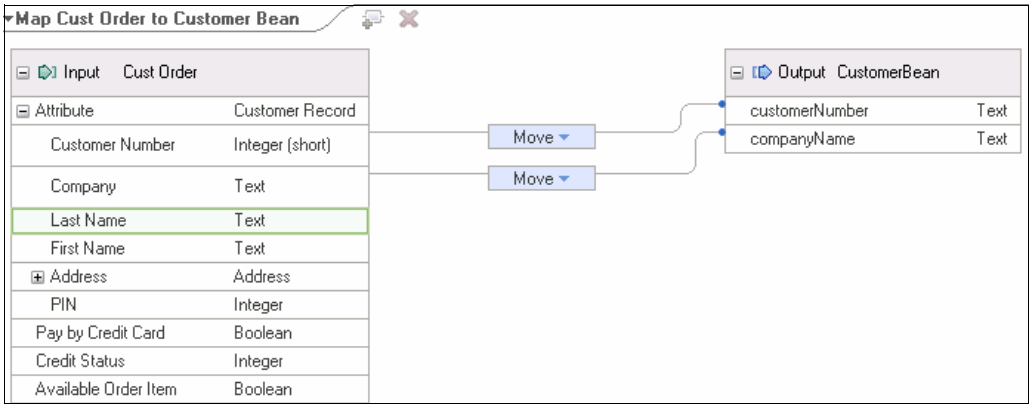

Figure 3-26 The Map editor

When working with repeating tasks, it can be more straightforward to draw a connection to an earlier point in the process than using a loop. The WebSphere Integration Developer concept of a cyclic flow is now available in WebSphere Business Modeler for backwards connections (shown in Figure 3-27). Simply draw a connection back to an earlier part of the process. Take care, however, that there is a way to get out of this loop, or it will run indefinitely.

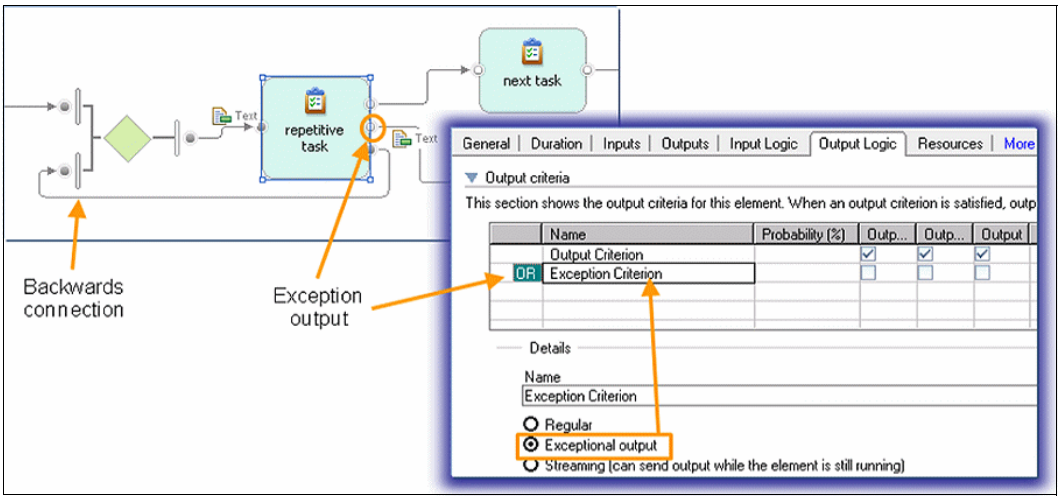

Figure 3-27 Using a backwards connection and exceptional output

To address the handling of problems that might arise when a process runs, IT typically defined fault handlers using tools, such as WebSphere Integration Developer. This makes sense for IT-related exceptions, but the LOB must have a way to indicate how business-related exceptions are dealt with and to be able to test them before implementation. With WebSphere Business Modeler, you can import Web services that have defined fault handlers. Alternatively, you can create fault outputs in a given task, triggered by exception-handling criteria to generate exceptional output.

3.6.2 Implementation-ready business measures

Just as the ability to test processes is greatly accelerated with the Interactive Process Design capability, which generates BPEL code and deploys it directly to a test server, a similar capability is provided for business measures. You can define business measures and test them before passing them to IT for implementation. As with business processes, you must be in WebSphere Process Server mode to use Interactive Process Design. When *Test on Server*

is invoked, a monitor model is generated and deployed to a target-managed deployment environment that is configured with WebSphere Business Monitor.

Define business measures and test them before passing them to IT for implementation

Your business measures (and any dependent business measures) must be valid and error free, and either based on a predefined template or on a fully specified calculation expression. It might be helpful to develop and test your business measures in stages. For example, when the process model is relatively stable, begin by defining an instance metric (elapsed duration of an end-to-end process). After verifying that the correct business measure is being rendered in the business space, define a KPI (average process duration) that performs a function (average) on the set of aggregated instance metrics (shown in Figure 3-28). When deployed, the KPI value changes while you iteratively complete process instance runs.

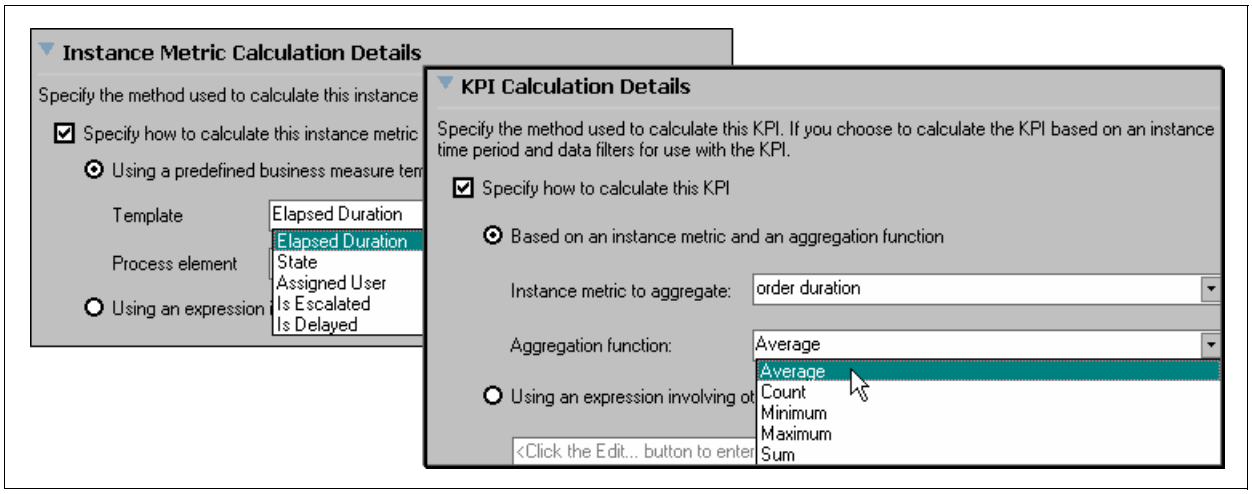

Figure 3-28 Specifying the calculation details of a business measure

3.7 Summary

WebSphere Business Modeler enables business analysts to easily and rigorously describe business processes, accelerate process definition by using various assets, collaborate across the organization to ensure that the processes reflect business and IT requirements, simulate and refine them for optimal business results, deploy and test them in a test sandbox, and effectively interact with IT for process implementation.

4

Enabling BPM with WebSphere Integration Developer and WebSphere Process Server

This chapter discusses enabling business process management (BPM) with WebSphere Integration Developer and WebSphere Process Server. WebSphere Integration Developer and WebSphere Process Server can help you perform the following tasks:

- Create agile business solutions with business rules and dynamic service selection
- Leverage business process models designed by business analysts
- Integrate human tasks and forms with business processes
- Test and deploy BPM solutions on proven, robust runtime environments
- Keep pace with industry standards

4.1 Introduction

Many clients start the business process management (BPM) journey focusing on end-to-end process automation. The primary purpose behind process automation is to improve business performance by automating business processes, which requires us to better understand and formalize processes to make them more efficient.

Process automation works by streamlining processes across disjointed IT systems, information, and human tasks, orchestrating them into an optimized process flow. Process automation includes human workflow management capabilities to orchestrate manual tasks, run them faster, and make them repeatable and consistent (shown in Figure 4-1). It also includes broad process integration capabilities to connect to diverse IT systems and information, including the use of service-oriented architecture (SOA), adapters, and other integration techniques.

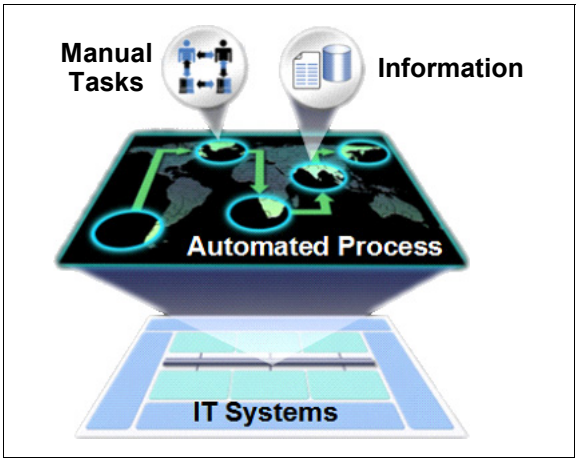

Figure 4-1 Process automation

The IBM BPM strategy relies on two complementary products to enable BPM solutions that deliver key process automation capabilities: WebSphere Process Server to run and manage deployed BPM solutions and WebSphere Integration Developer to design and test BPM solution implementations.

A high-performance processing engine built on open standards

WebSphere Process Server is a high-performance processing engine that supports processes so that they can meet business goals. It ensures that processes designed in WebSphere Business Modeler or WebSphere Integration Developer run consistently, reliably, securely, and with transactional integrity. It is built on open standards and deploys and runs processes that orchestrate services (people, information, systems, and trading partners) within a SOA or non-SOA infrastructure. Furthermore, WebSphere Process Server supports various BPM capabilities, including processes, business rules, state machines, human tasks, and forms integration with processes. These capabilities are built on top of a robust application server, an enterprise service bus, and SOA underpinnings (shown in Figure 4-2).

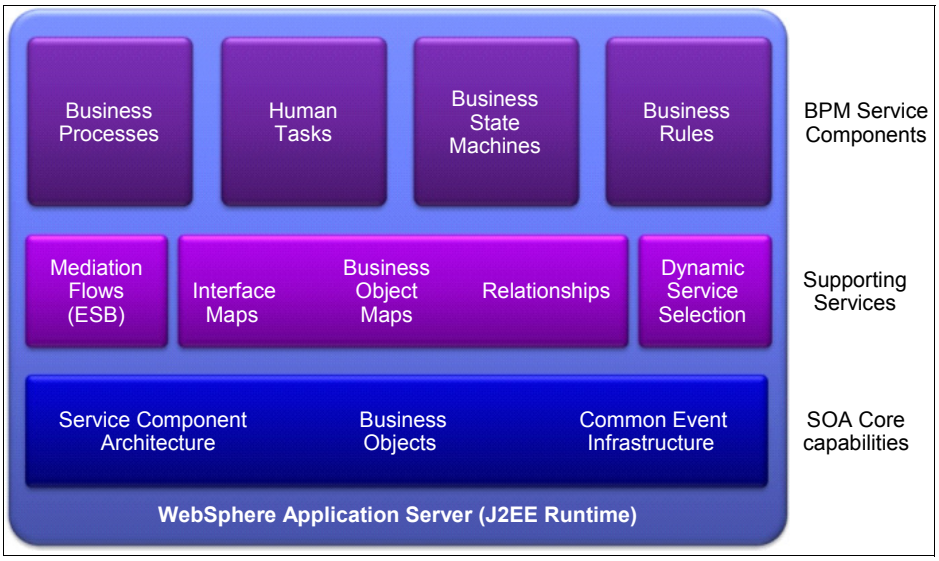

Figure 4-2 WebSphere Process Server

WebSphere Process Server orchestrates the assets of a business to form highly optimized and effective processes, enabling both integration-centric and human-centric scenarios. It is built on and contains WebSphere Enterprise Service Bus, which includes service bus capabilities to mediate disparate services, helping to maximize the reuse of assets wherever they are, regardless of the vendor, platform, or whether they are built by companies themselves or provided as part of packaged applications.

WebSphere Process Server enables dynamic workflows for greater flexibility and control and, when combined with the power of WebSphere Business Monitor, processes can be optimized to meet changing business requirements, giving businesses a competitive advantage.

Accelerate the adoption of SOA by rendering existing IT assets as service components

WebSphere Integration Developer (shown in Figure 4-3) provides a user-friendly, Eclipse-based authoring environment for end-to-end integration in SOA, enabling integration developers to build SOA-based BPM and integration solutions across WebSphere Process Server, WebSphere Enterprise Service Bus, and WebSphere Adapters. Its rich features simplify integration and accelerate the adoption of SOA by rendering existing IT assets as service components, encouraging reuse and efficiency. It enables rapid assembly of business solutions by wiring reusable service components that can be discovered from multiple locations, such as IBM WebSphere Service Registry and Repository and IBM Rational Asset Manager.

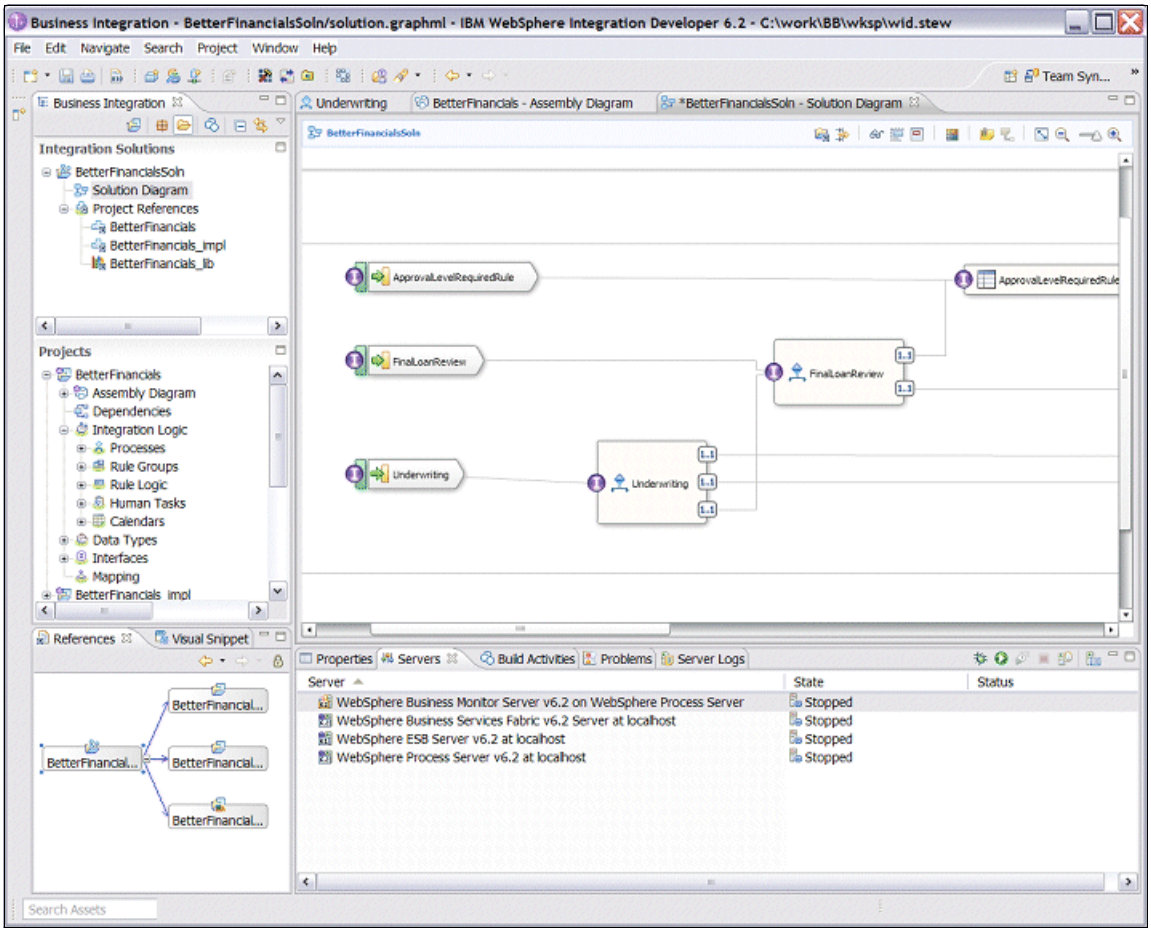

Figure 4-3 WebSphere Integration Developer

WebSphere Integration Developer enables integration developers to assemble complex business solutions, whether processes, mediations, adapters, or code components, using drag-and-drop technology to visually define the sequence and flow of business processes. It is closely integrated with WebSphere Business Modeler to import models for rapid implementation.

The integration developer has access to a wide range of functionality when authoring process integration solutions. Models imported from WebSphere Business Modeler are automatically translated into a set of standards-based Business Process Execution Language (BPEL) processes and XML Schema Definition (XSD)-typed data. Alternatively, the integration developer can code services in languages that are well suited to the business integration domain, wire services together in the assembly editor, and lay out the orchestration between processes, exposing this orchestration as a service for further reuse.

4.2 A foundation for reusable assets

With BPM enabled by service-oriented architecture (SOA), you can leverage your organization's assets to the fullest extent. Business integration developers work either top-down (aggregate existing assets) or bottom-up (author new functionality) to produce enterprise-quality software (Figure 4-4). Either method of development presents several hurdles when proprietary technologies are introduced, either by requiring developers to master unfamiliar concepts or by creating problems when integration with other vendors is

necessary. IBM addresses these challenges by supporting the Service Data Objects (SDOs), Service Component Architecture (SCA), and Web Services Business Process Execution Language (WS-BPEL) open standards.

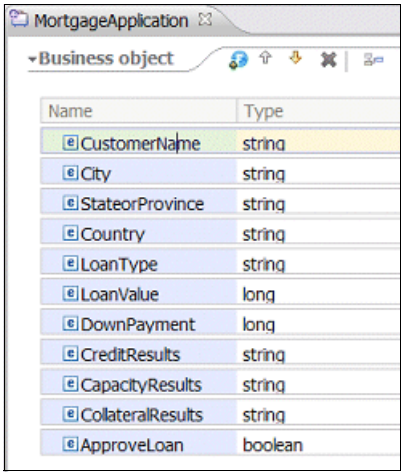

Figure 4-4 Business Object editor in WebSphere Integration Developer

4.2.1 Service Data Objects (SDOs)

Business integration developers must master different data implementations, such as Enterprise JavaBeans™ (EJBs), Java Database Connectivity (JDBC™) RowSets, and Java Message Service (JMS) message objects. Because SDOs provide a consistent view of the data with an abstraction layer for disconnected data, developers can minimize the learning curve that is usually required to handle multiple standards. IBM supports the SDO standard with the business object framework, which implements and extends the SDO standard with concepts that are important to integration solutions and are used to further describe data that is exchanged between Service Component Architecture (SCA) services. SCA is an industry-standard architecture in which a set of components are defined and wired together using interfaces.

The business object framework allows integration developers to easily define a generic data model. Because the underlying technology is based on well-defined XML, it is relatively easy to map application specific data into common formats using the IBM XML mapping tools or manipulate that data as it flows through the main process.

Alternatively, developers can generate business object definitions from existing enterprise assets using the External Service wizard (for example, with an existing SAP® or Oracle® system) or by importing existing XML Schema Definition (XSD) files into the workspace.

4.2.2 Service Component Architecture (SCA)

The key concept behind delivering SOA solutions is that each service should have well-defined interfaces, shielding users from implementation details so that they can focus on the functionality that the services deliver and how that functionality relates to business needs. IBM has joined with several other industry participants to define a standard for component-based architecture: SCA.

SCA provides loose coupling to the endpoint implementation for services that are defined in the business process. Integration developers can abstract endpoints further by performing lookups through the WebSphere Service Registry and Repository. Plus, business analysts

can reuse services that were defined in WebSphere Integration Developer as black-box implementations in WebSphere Business Modeler, providing a clear delineation between the service producer and consumer (shown in Figure 4-5).

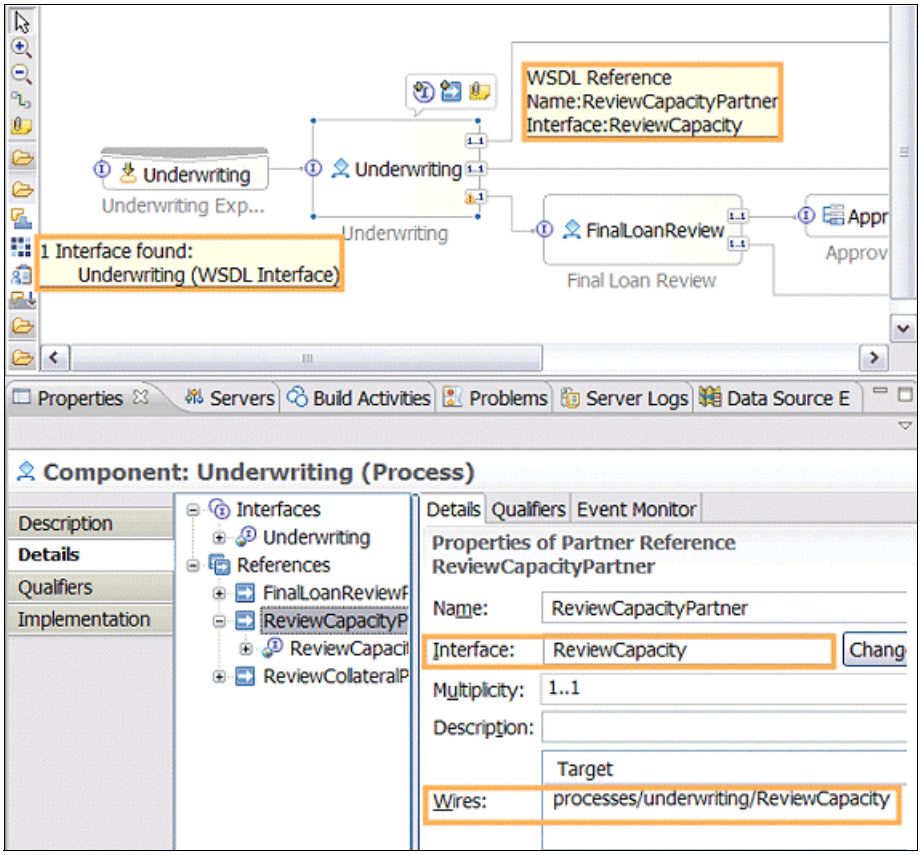

Figure 4-5 Assembly editor in WebSphere Integration Developer

Each of the main programming models offered in WebSphere Integration Developer is represented as a SCA component at development time (human task, Java, process, rule group, or state machine). The key advantage to using an SCA component is that the interface is separate from the implementation; therefore, an implementation strategy can change without requiring the interface that is defined in the SCA component to change.

When development is complete, the integration developer can extend the system by importing services or making new services available for reuse. The WebSphere Integration Developer toolset seamlessly represents all data as SDOs, reducing programming complexity.

4.2.3 BPEL choreography

Using the BPEL programming language, the integration developer can orchestrate multiple service invocations with more complex business logic (shown in Figure 4-6). The base language defines support for multiple invocation paths, variables, and complex compensation or fault handling when errors are encountered.

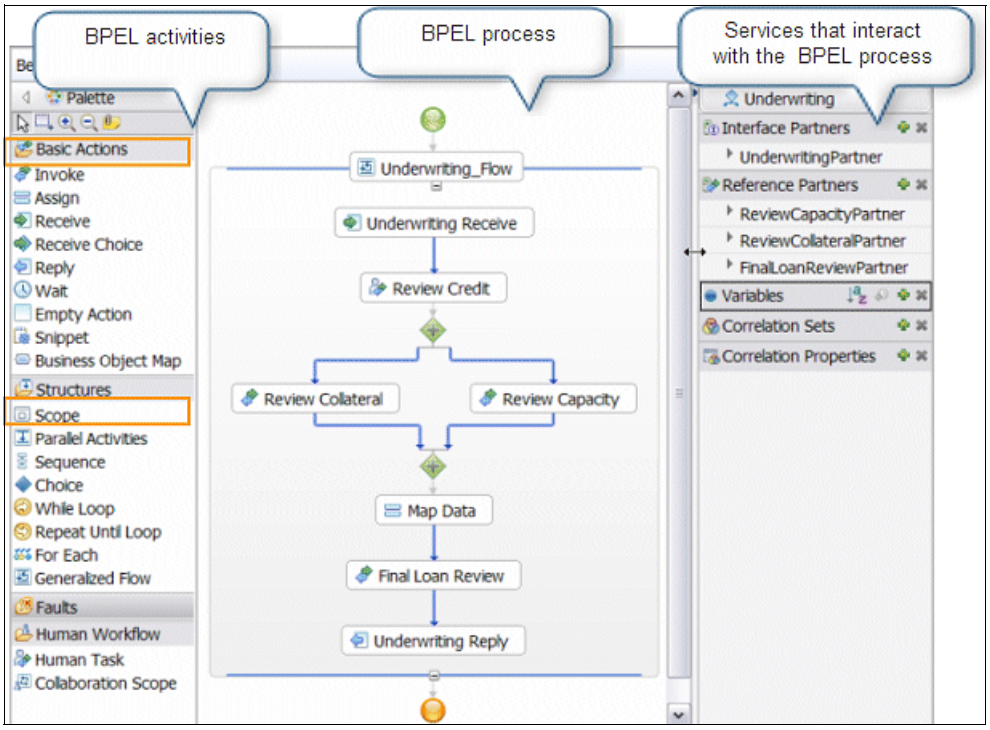

Figure 4-6 Process editor in WebSphere Integration Developer

IBM supports version 2.0 of the WS-BPEL standard, as well as concepts introduced by two extensions to the WS-BPEL standard: BPEL for Java and BPEL4People. BPEL for Java allows integration developers to define complex business logic inside their processes using the Java programming language. BPEL4People defines a mechanism for integration developers to include human tasks in the process.

4.3 Enabling agility in business solutions

BPM implementations respond faster to changing needs when supported by process agility enablers. Agility enablers represent various tools that affect a change in a business process. Each of the six agility enablers, policies, rules, service selection, active content, events, and analytics, complement each other and are all available to make processes more flexible and responsive.

WebSphere Process Server supports agility by supporting business rules. WebSphere Enterprise Bus (embedded in WebSphere Process Server) supports mediation policies and dynamic service selection to enable the dynamic invocation of services.

4.3.1 Business rules

The business rule logic that is extracted from a business process must be modifiable as the needs of the business change. For each business rule, an administrator can change a number of items. For example, for each operation defined on a business rule group, the administrator can modify the schedule of active rules for that operation. The administrator can modify the current business rule that is active for the operation or can schedule business rules to be active in the future. The administrator can even update a business rule (rule set or decision table) after it has been deployed to WebSphere Process Server.

In addition, by using templates (shown in Figure 4-7), business analysts can modify parts of the rule logic in the rule sets or decision tables. For example, if a business rule is used to specify the discount on orders above a specific amount, the amount of the discount as well as the amount of the order are parameters that, with a template definition, a business analyst can modify using different management clients.

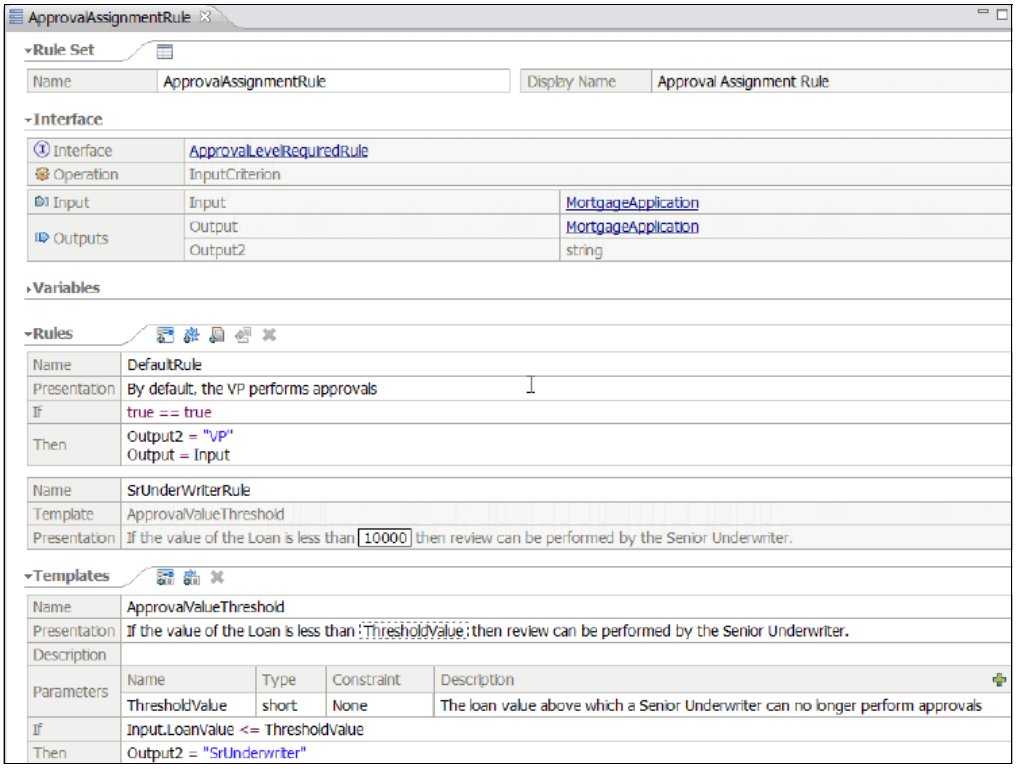

Figure 4-7 A rule set with rules specified using templates

Business analysts can also use the Business Rules Manager Web-based tool (shown in Figure 4-8) to make changes to business rules that are deployed to WebSphere Process Server. They can also search for business rule groups using property values that are specified in WebSphere Integration Developer or for properties that were added using the Business Rules Manager.

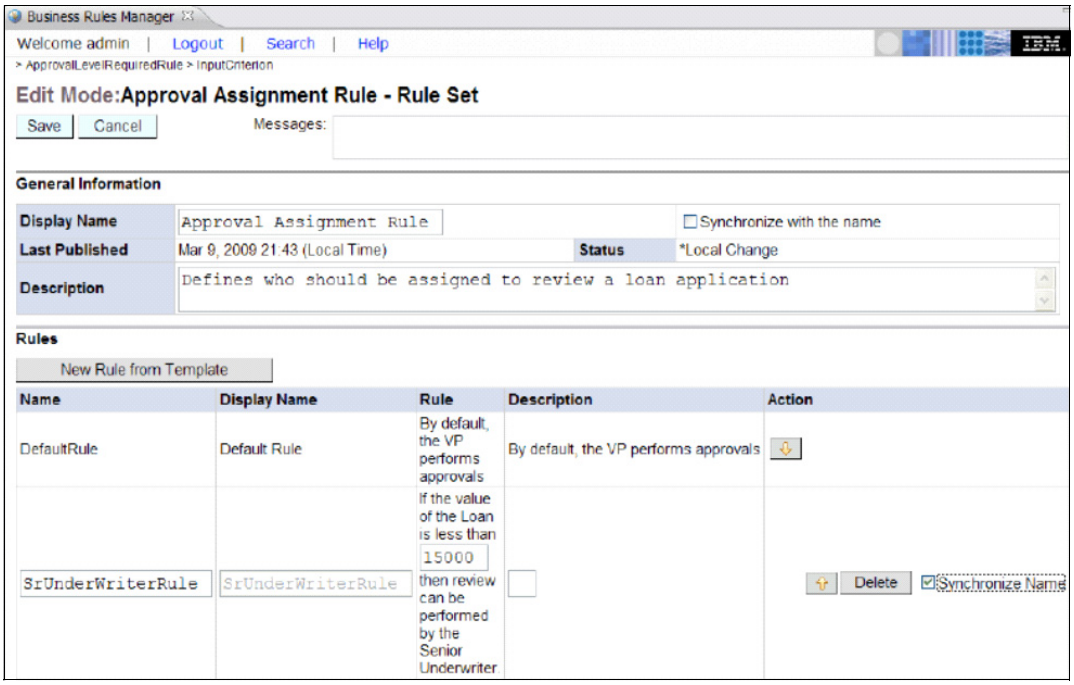

Figure 4-8 Business Rules Manager

With the Business Rules widget, a business analyst can update the parameters of a rule. Figure 4-9 shows the Business Rule widget.

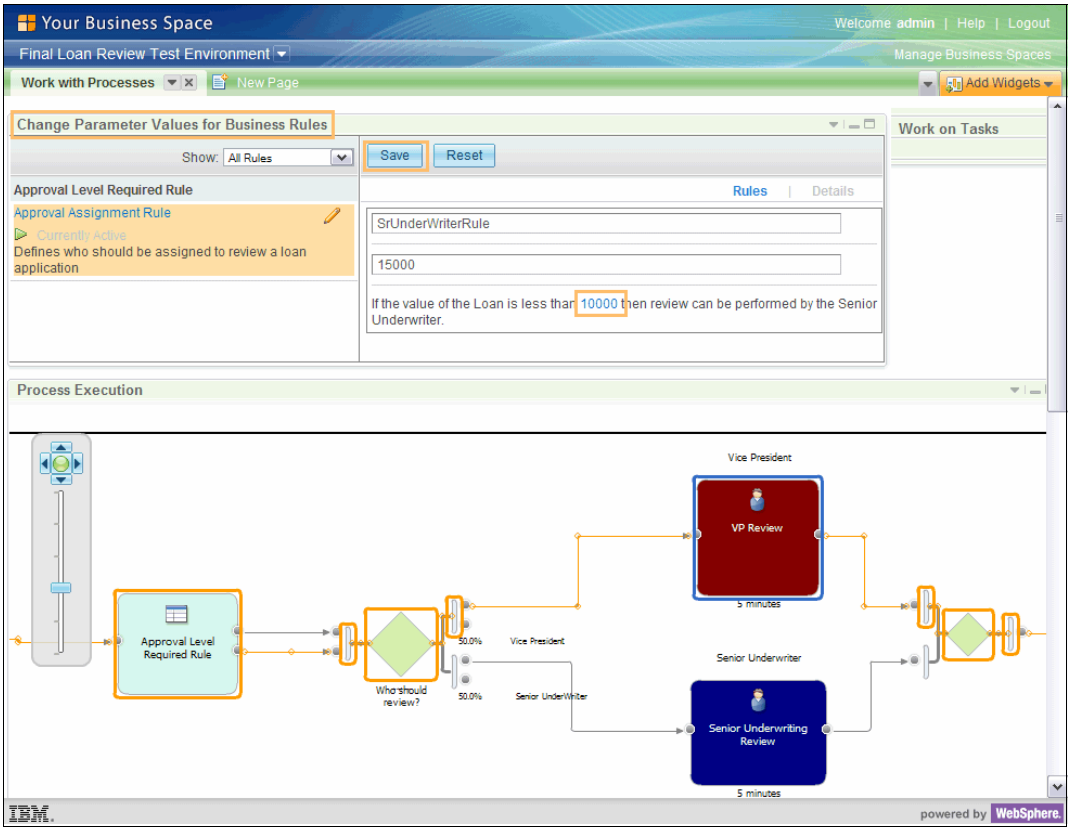

Figure 4-9 Business Rules widget

4.3.2 Service selection and mediation policies

WebSphere Process Server is built on and contains WebSphere Enterprise Service Bus (ESB). WebSphere ESB delivers a flexible connectivity infrastructure for integrating applications and services and enabling SOA development. WebSphere ESB also provides service selection and mediation-policy management through its integration with WebSphere Service Registry and Repository.

4.3.3 Dynamic service selection

With the service selection capability, integration developers can invoke an external service as part of processing a message in a mediation flow, perhaps even dynamically by deciding on the actual service to be invoked at run time rather than at design time.

Mediation flows can be integrated with WebSphere Service Registry and Repository to make service applications more dynamic and more adaptable to changing business conditions (shown in Figure 4-10). Furthermore, WebSphere Service Registry and Repository can store information about services that are in use, will be used, or that people want to be aware of. These services might be in local systems or in remote systems.

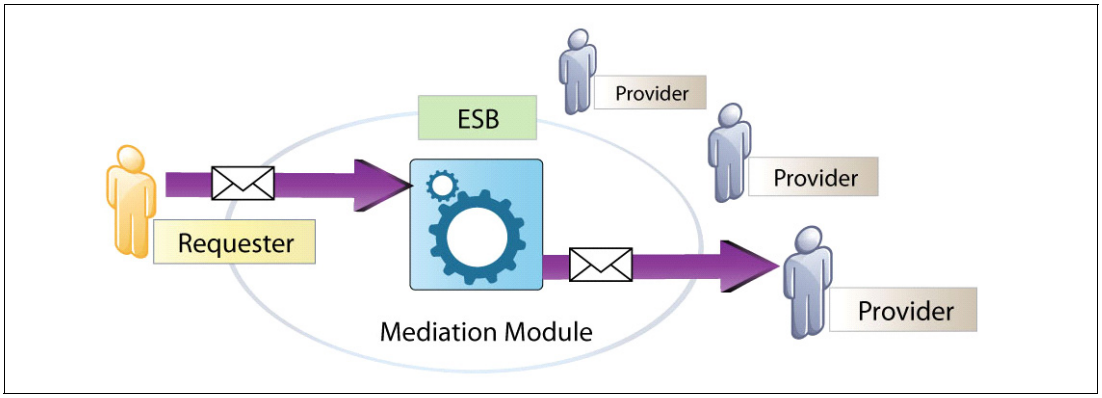

Figure 4-10 Dynamic service selection

When developing an SCA module that needs to access service endpoints from WebSphere Service Registry and Repository, the integration developer includes an Endpoint Lookup primitive in the mediation flow. At run time, the Endpoint Lookup mediation primitive obtains the service endpoints from the registry that match its requirements and sets up the appropriate target service for invocation. Figure 4-11 shows the Endpoint Lookup primitive.

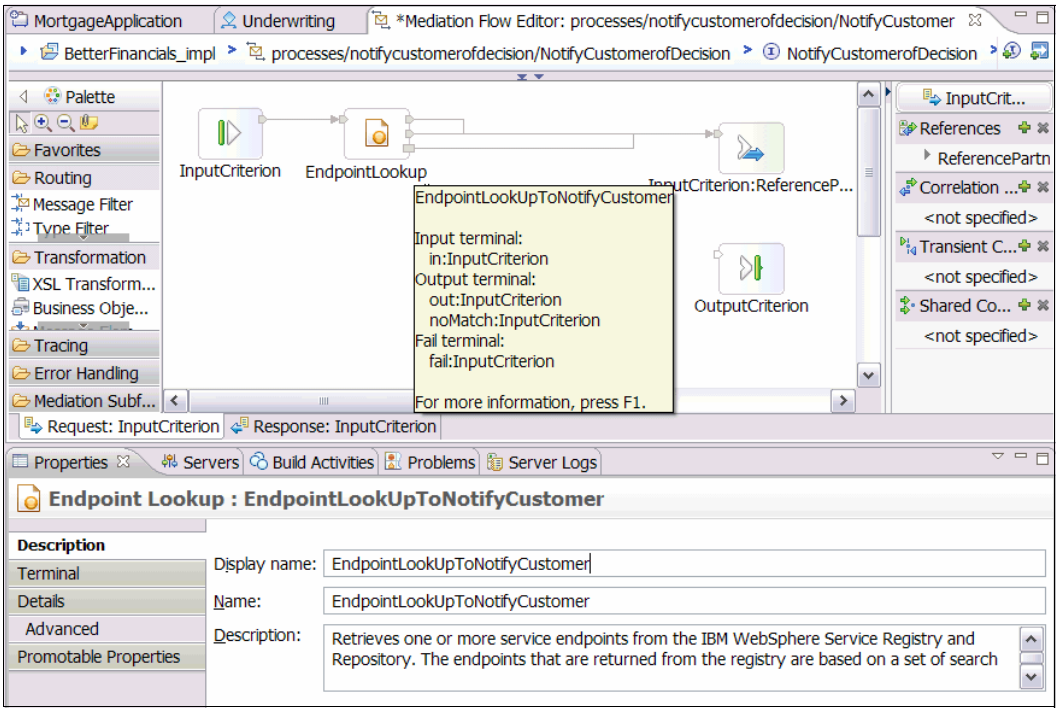

Figure 4-11 Endpoint Lookup primitive in WebSPhere ESB

4.3.4 Mediation policies

Many enterprises want to dynamically control their service interactions by using contextual information. You can develop new service interactions that achieve greater levels of flexibility and administrative control using mediation policies, which improve the contextual control of service interactions.

Achieve greater levels of flexibility and administrative control using mediation policies

WebSphere ESB leverages WebSphere Service Registry and Repository for mediation policy governance. When an integration developer uses WebSphere Integration Developer to create SCA modules that contain mediation flows, any module property that is promoted (making a property modifiable by the runtime administrator) is also a dynamic property. Dynamic properties can be overridden, at run time, using mediation policies in WebSphere Service Registry and Repository.

With the Policy Resolution Mediation primitive (Figure 4-12), WebSphere Service Registry and Repository can be queried to obtain the appropriate policy for the message context. This primitive evaluates the mediation policies and resolves them to a single effective policy (in case of multiple matching policies), and then propagates them along the mediation flow.

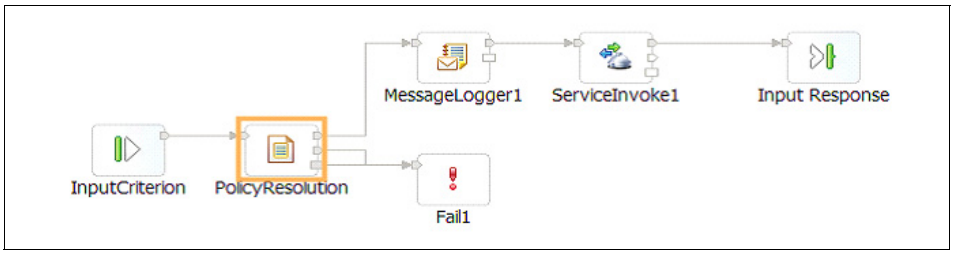

Figure 4-12 Policy Resolution primitive in WebSphere ESB

In Figure 4-13, two mediation policies were loaded into WebSphere Service Registry and Repository. Depending on the value of the quality-of-service (QOS) conditional attribute in the incoming message, WebSphere Service Registry and Repository returns the appropriate policy, allowing WebSphere ESB to choose the appropriate service for an invocation: either the one with the lower uptime or the one with the higher uptime.

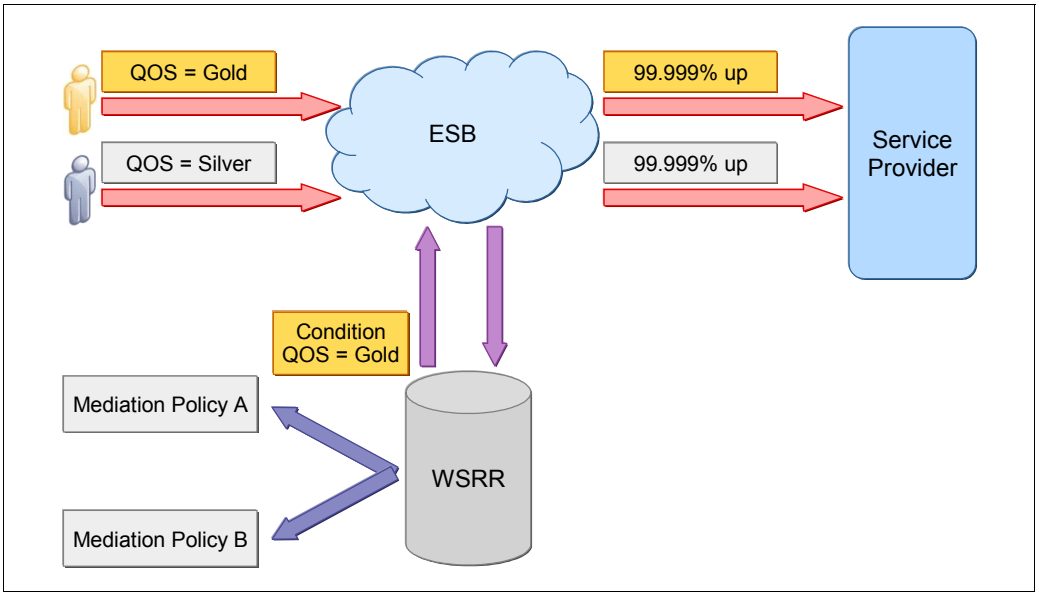

Figure 4-13 Policy resolution

4.4 Accelerating time to value

WebSphere Integration Developer provides a rich set of capabilities that help in the design, development, implementation, and, ultimately, deployment of your BPM solutions, helping your IT teams achieve a high level of productivity and efficiency. It provides a rich set of editors for creating BPM artifacts, wizards in various contexts, and pattern-based approaches to developing BPM solutions. Furthermore, it contains a copy of the WebSphere Process Server runtime environment that an integration developer can use to test solutions. The following sections highlight some key functions in WebSphere Integration Developer.

4.4.1 Leveraging the process model

To accelerate the development of end-to-end BPM solutions, WebSphere Integration Developer is closely integrated with WebSphere Business Modeler and WebSphere Business Monitor. Business Analysts who are the domain experts define and create the Business

Process, which can then be exported to WebSphere Integration Developer for the IT developer to refine and deploy into WebSphere Process Server. The following sections highlight the integration between the products.

4.4.2 Interactive process design

Interactive Process Design (IPD) increases time to value by enabling executable process models to be fully defined and tested in WebSphere Business Modeler by business analysts for typical use cases. The business analyst creates the process model and runs it directly in WebSphere Process Server to ensure that the process will run correctly in the runtime environment (shown in Figure 4-14).

The integration developer supports the business analyst by setting up a test environment that runs WebSphere Process Server, creating services that the business analyst can use in WebSphere Business Modeler and helping the business analyst with problem determination. WebSphere Integration Developer provides a fully functional unit test environment to test and refine the business solution.

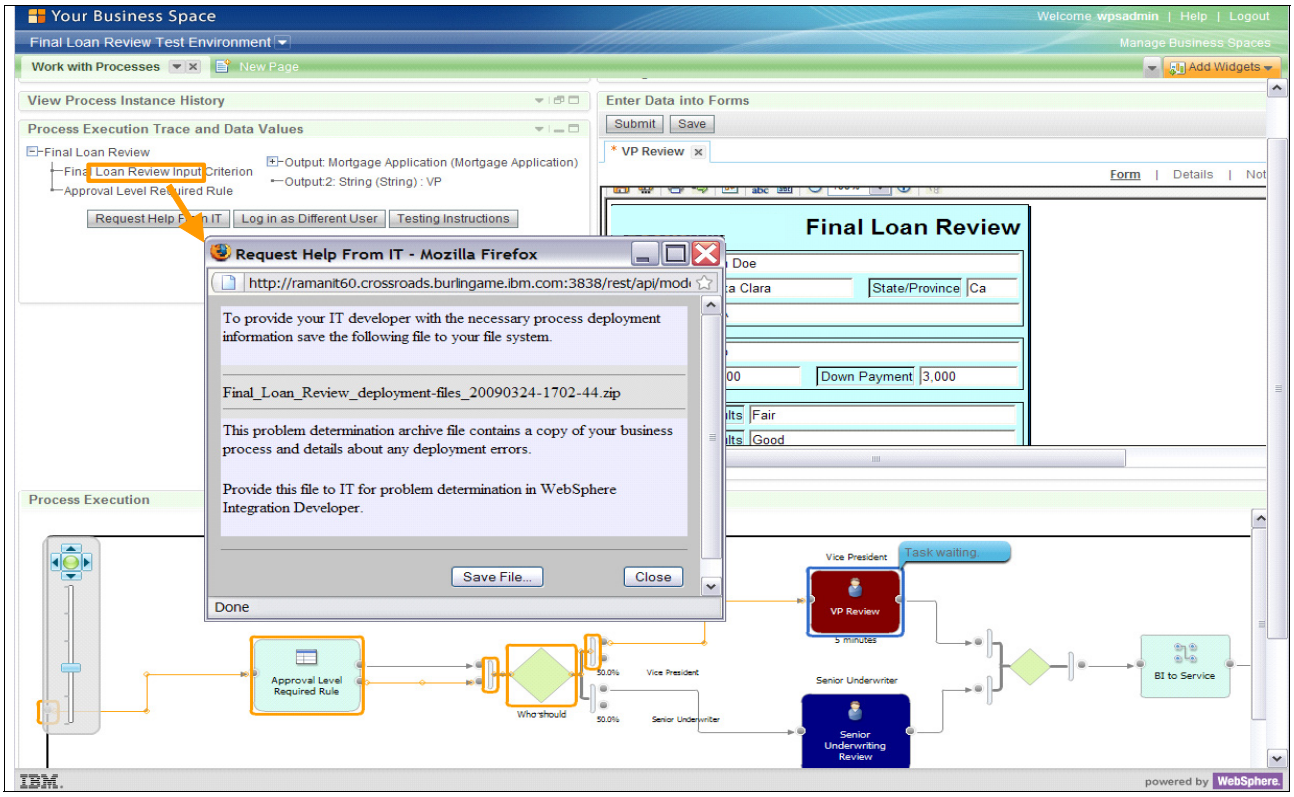

Figure 4-14 Problem determination for interactive Process Design

4.4.3 Consuming iterative definitions from WebSphere Business Modeler

The process model that the business analyst created in WebSphere Business Modeler will eventually be deployed into a production environment that runs WebSphere Process Server. WebSphere Business Modeler includes a WebSphere Process Server mode that constrains the process model to ensure that it can be exported to WebSphere Integration Developer successfully and offers guidance to help the business analyst specify technical details to fine-tune the nature of the IT-level artifacts that are generated when the artifacts are exported. The integration developer receives these artifacts from the analyst and modifies

those artifacts in WebSphere Integration Developer for eventual deployment into WebSphere Process Server (shown in Figure 4-15).

On many occasions, the relationship between business process elements that are defined in WebSphere Business Modeler and the corresponding IT artifacts in WebSphere Integration Developer is not always one to one. The challenge remains to manage iterations of definitions on both the business and IT sides, ensuring that each team effectively understands the changes that have been made in the other domain and keeps them in sync.

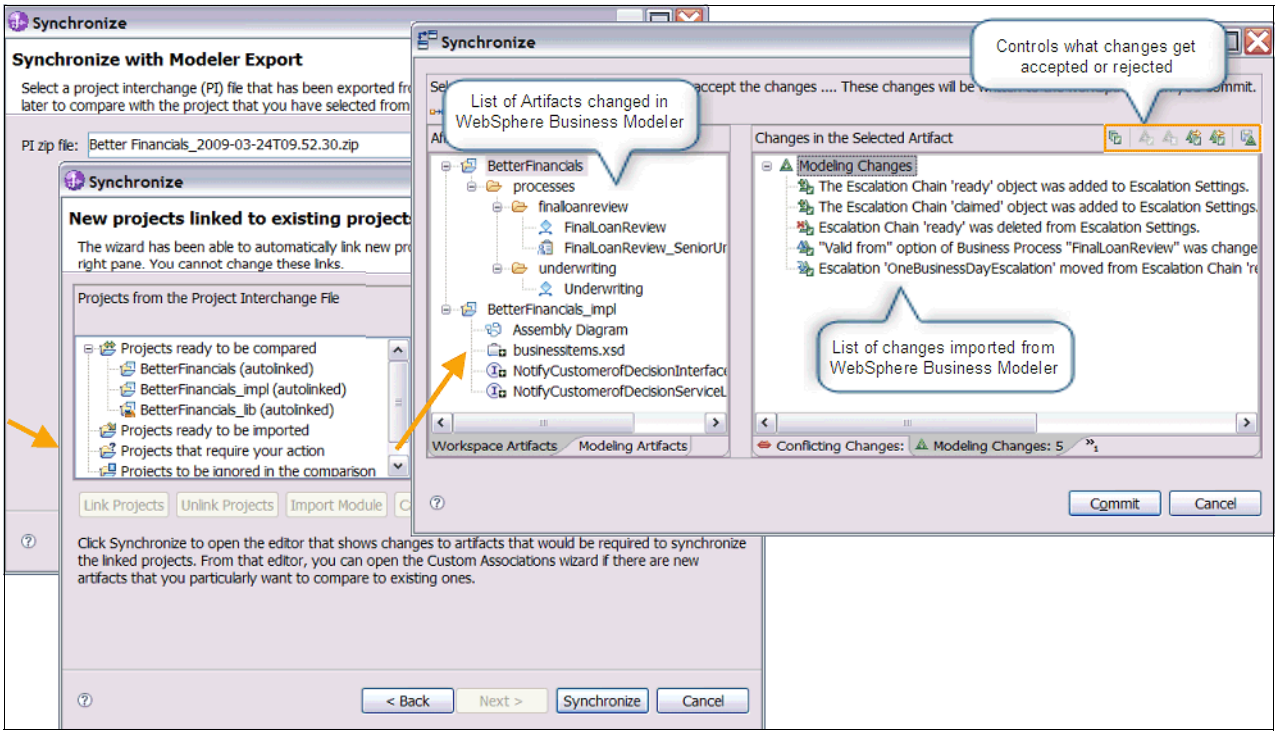

Figure 4-15 WebSphere Business Modeler project synchronization wizard

The integration developer uses WebSphere Integration Developer to receive updates from the business analyst (as shown in Figure 4-15), see specifically where changes have been made in the imported artifacts, comparing changes to existing versions of the artifacts, and merge the appropriate changes. The integration developer can also generate a change-report file that lists the model implementation changes that a business analyst can use in WebSphere Business Modeler to validate the potential impact on process semantics.

4.4.4 Sharing evolving projects for monitor model development

A business analyst can use events that occur while process instances run on WebSphere Process Server as input into what business users see in WebSphere Business Monitor dashboards. WebSphere Integration Developer provides first-class integration with the WebSphere Business Monitor development toolkit to accelerate the development of monitor models for these processes.

In WebSphere Integration Developer, the integration developer can use the Generate Monitor Model wizard (Figure 4-16) to introspect each module and generate a stand-alone monitor model that is based on a predefined template for components in that module (process, human task, business rule, and so on). The developer can further refine the generated model while maintaining the flexibility to add other monitoring elements iteratively, which allows both the application and the corresponding monitoring solution to co-evolve. The integrated tools keep

the two code bases (implementation code and monitor model) in sync, without requiring the developer to manually reconcile existing and updated monitor models.

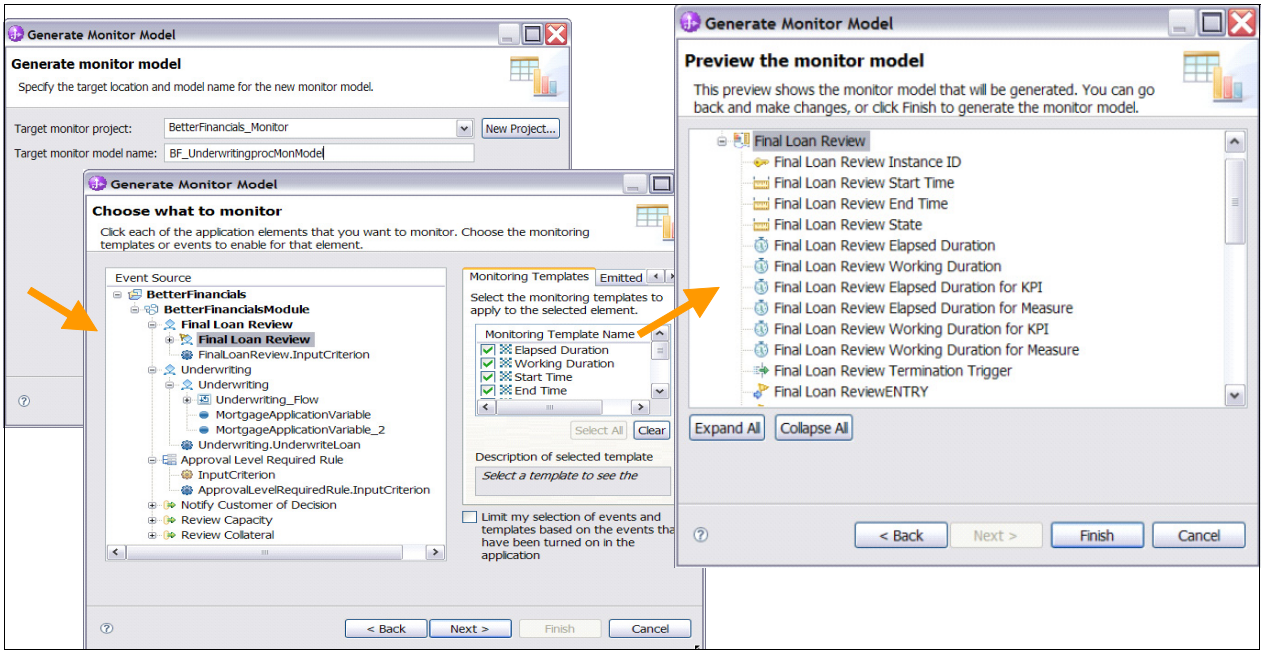

Figure 4-16 WebSphere Business Monitor model generation wizard

4.4.5 Team development

A central asset repository can be used to store and reuse BPM artifacts, allowing the BPM solution development team to share and browse the artifacts. For example, a developer might want to find and reuse the approved version of a process model, even if someone else created it.

In WebSphere Integration Developer, you can share assets using IBM Rational Asset Manager, Concurrent Versioning System (CVS), and ClearCase repositories. Notification mechanisms can be set up to notify the developers when one of the assets they depend on for their solutions is updated in the repository. Figure 4-17 shows the integration with the CVS repository, allowing collaboration and sharing of artifacts. WebSphere Integration Developer allows the developer to browse and synchronize artifacts with the repository as needed.

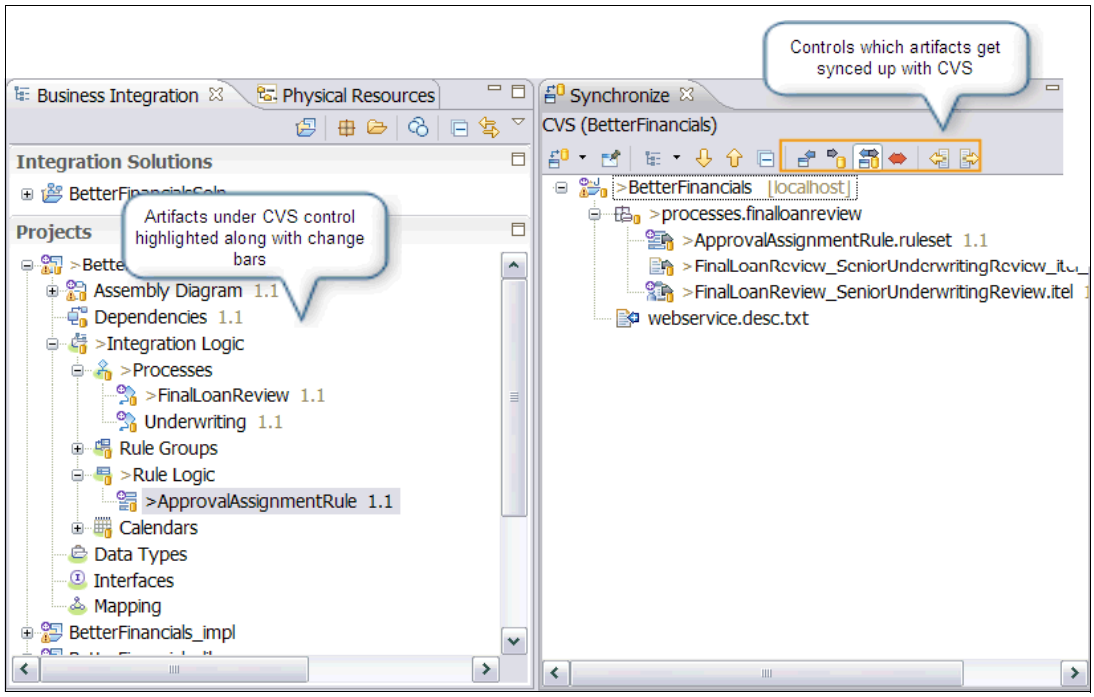

Figure 4-17 CVS integration in WebSphere Integration Developer

4.4.6 Integration Solutions view

When working on broad solutions that encompass multiple business modules, libraries, and other dependent projects in a solution, the Integration Solutions view helps the integration developer organize groups of related projects and more easily perform common actions on the projects, such as sharing them in a team environment.

The integration developer can open the integration solution diagram in the integration solution editor, see the relationships between the related projects that are referred to in the integration solution, and perform functions that apply to all modules in a solution, such as testing the solution and checking the solution into a repository.

Organize groups of related projects and more easily perform common actions on those projects

Figure 4-18 shows a snapshot of an integration solution in the solution diagram editor. The diagram shows the projects and libraries used in the solution as well as dependencies on external Web services.

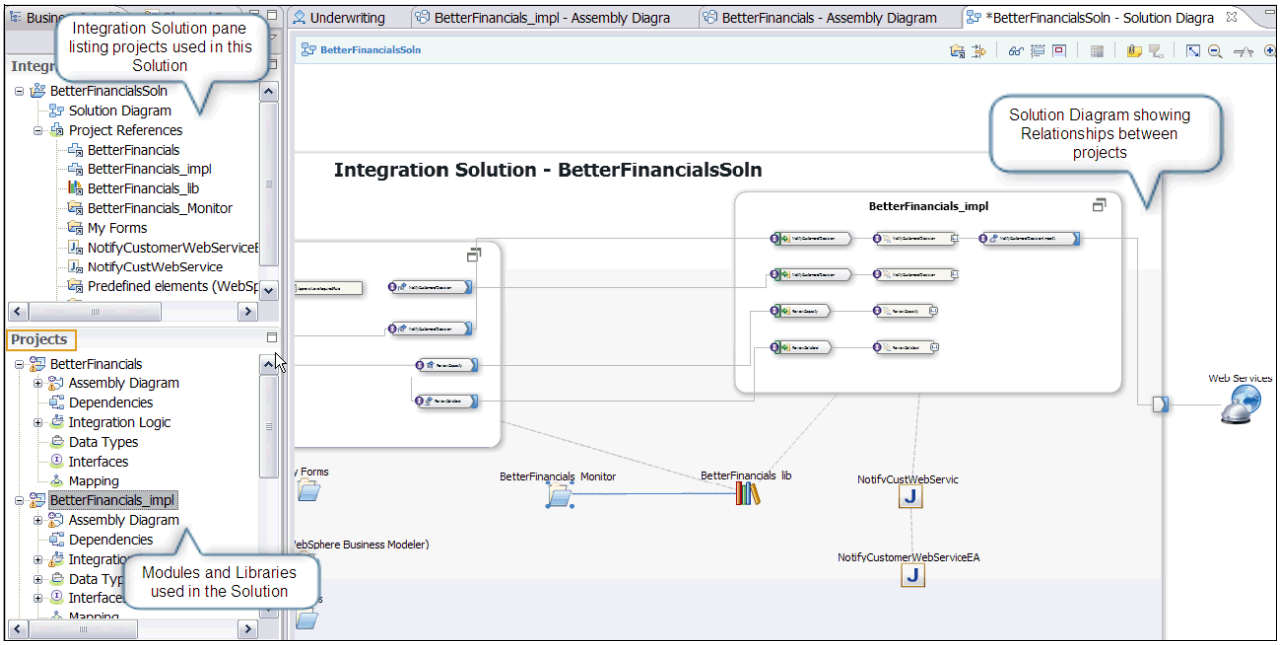

Figure 4-18 Integration Solutions view

4.4.7 Tools for testing and problem determination

BPM solutions need to be thoroughly tested before being deployed into production environments with WebSphere Process Server. WebSphere Integration Developer provides the Integration Test client to test, debug, and troubleshoot modules, components, and complete solutions. The test client features an intuitive user interface that enables integration developers to easily manage and precisely control tests. The integration test client is shown in Figure 4-19.

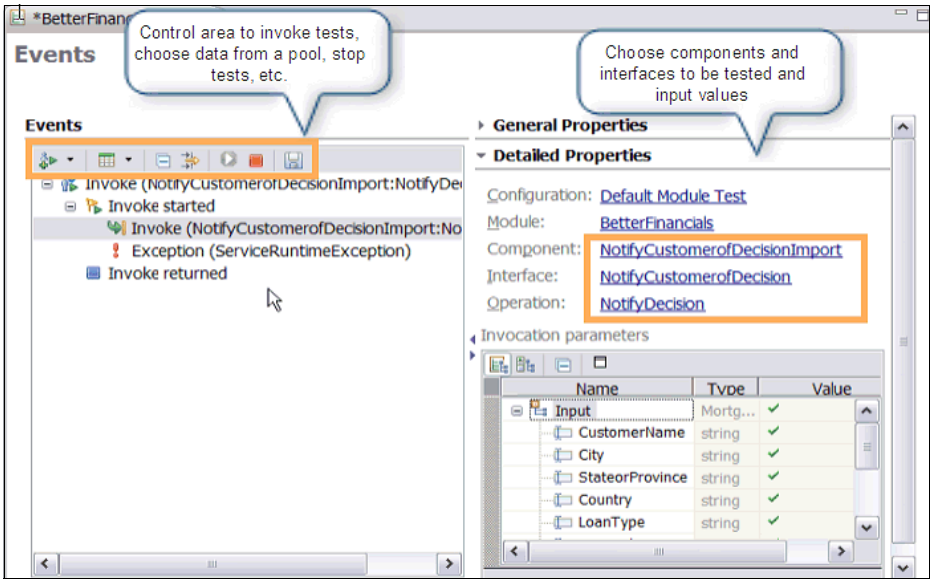

Figure 4-19 Integration Test Client

Almost all the tasks performed in the integration test client are executed through the Events and Configurations pages. In the Events page, the integration developer can perform

numerous test activities that enable interaction with the module during testing, such as selecting an operation to test, specifying values for the operation, and invoking the operation. In the Configurations page, the integration developer can edit the default test configuration or can create and edit new test configurations. In WebSphere Integration Developer, the integration developer can also create comprehensive test cases, test suites, and test buckets for fine-grained and scenario-level testing.

4.4.8 Server Logs view

It is often necessary to troubleshoot a solution during development time using logs and traces emitted by the server. The Server Logs view in WebSphere Integration Developer displays server console and log file records as well as invocation records when cross-component tracing capability is enabled (shown in Figure 4-20).

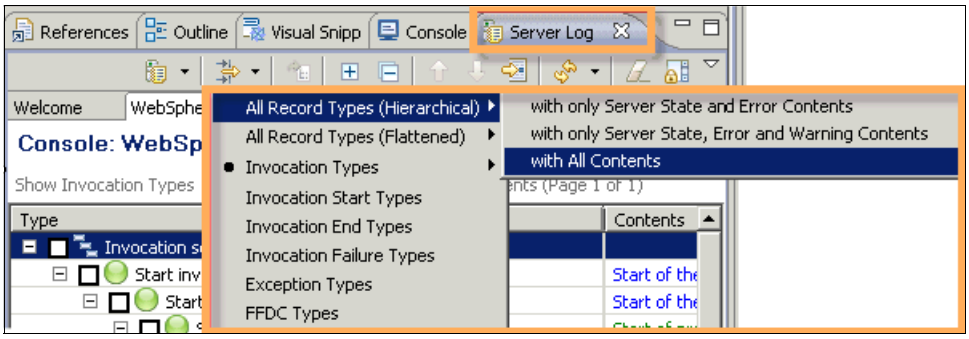

Figure 4-20 Server Logs view

The Server Logs view provides several advantages over the traditional Console view, such as the ability to filter records, display invocation records in hierarchical format (shown in Figure 4-21), and load invocation records directly into the integration test client when data is captured with cross-component tracing.

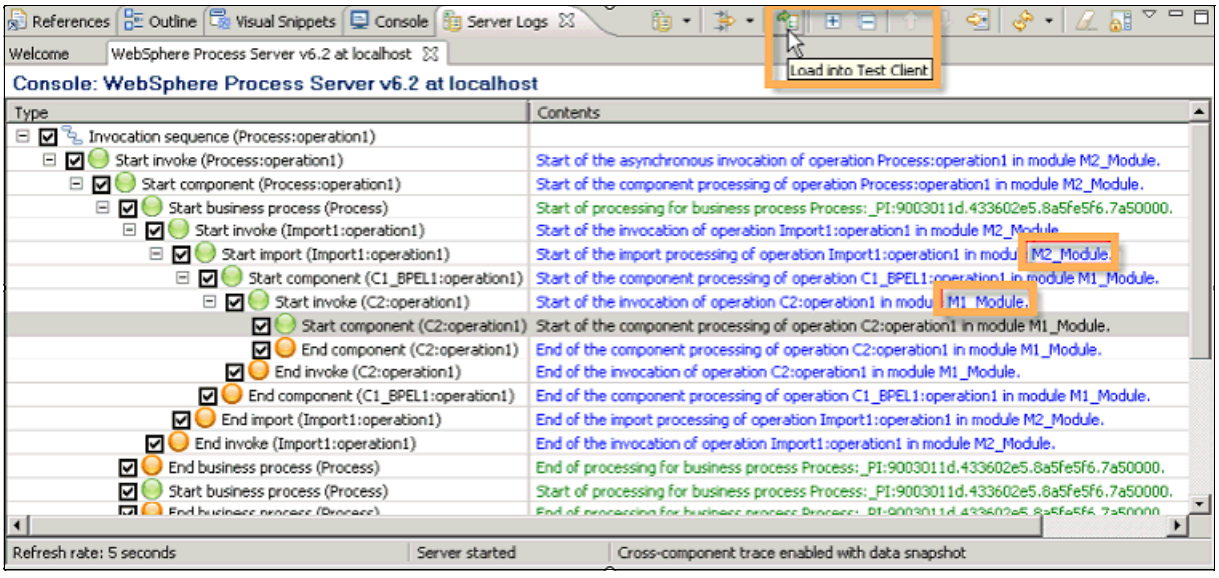

Figure 4-21 Hierarchical records in the Server Logs view

4.5 Enhancing human-centric BPM

With the ability to involve people in business processes in WebSphere Process Server, you can capture simple to complex business processes that include a mixture of automated and human steps. By treating a human task as another kind of service, you can build flexible processes that evolve to become more automated over time (for example, replacing a current human task with an automated service) without significantly reworking the original process.

WebSphere Integration Developer and WebSphere Process Server offer a broad range of support for human-centric BPM:

- Enhanced dynamicity for knowledge workers (case handling)
- Business calendar support
- Integrated forms capabilities
- Finer-grained control over the selection of people who may perform a human task

These features simplify configuring and managing processes that involve people, therefore, reducing the total cost of ownership.

4.5.1 Generalized flows

Using generalized flows, a business process includes a back link for returning to previous activities and includes gateways to synchronize flows similar to gateways in WebSphere Business Modeler.

This capability is especially useful in Interactive Process Design when the business analyst deploys the process model into WebSphere Process Server and the model includes synchronization points using gateways (shown in Figure 4-22). Back links help model more advanced processes and avoid complex Business Process Execution Language (BPEL) constructs.

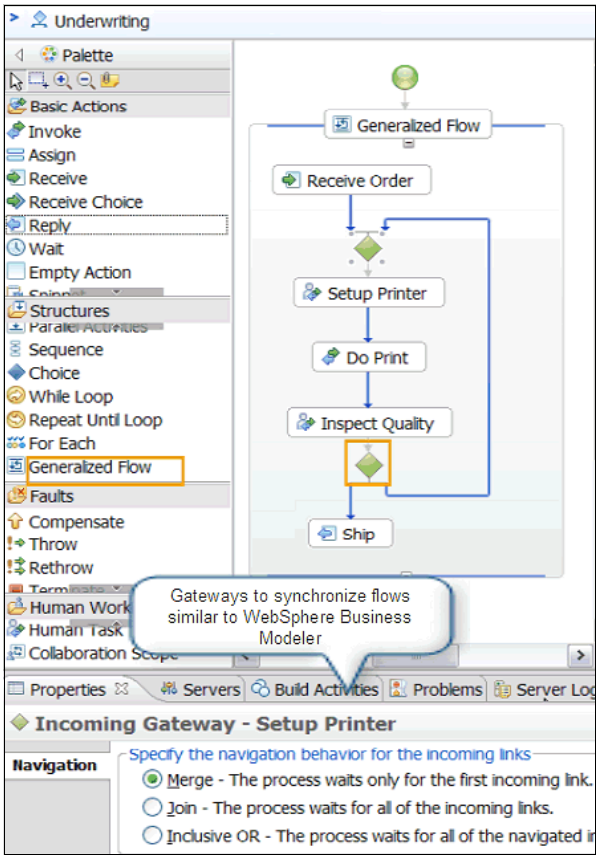

Figure 4-22 Generalized flow

4.5.2 Dynamicity for knowledge workers (case handling)

Enhanced dynamic workflows are business processes in which the business logic can be adapted at run time. For example, the assigned business worker might decide to repeat an activity, launch a subtask, or skip some steps in the business process. Business processes should provide the needed flexibility to efficiently run such scenarios.

WebSphere Process Server supports the ability to combine well-defined procedures with operational flexibility using the case-handling paradigm. Case handling allows dynamic changes, including the ability to skip or redo one or many human activities, support for adding human activities on the fly, and the ability to attach documents to business processes (shown in Figure 4-23).

Case handling leverages the expertise and knowledge of the task owner to enable flexible processes

Collaboration scopes are a type of generalized flow that is used to model dynamic workflows, providing the model for creating workflows that are conducive to actions, such as redo, skip, and add additional steps. This scope also sets up a case folder variable that can be used to share data documents.

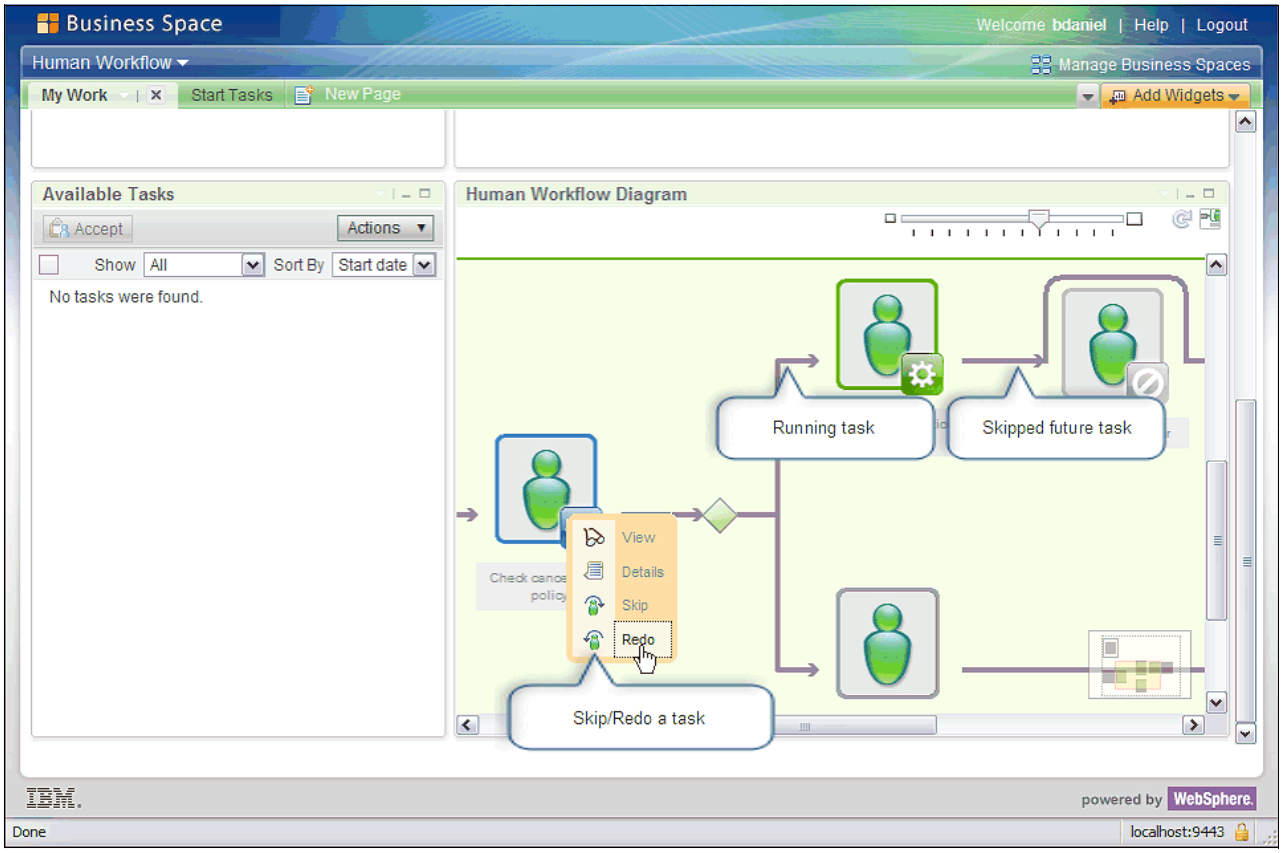

Figure 4-23 Case handling in WebSphere Process Server

Case handling is ideally suited to situations in which task owners use their knowledge to adapt business processes, because it enables the business analysts to create workflows that are well-defined, yet give the staff who are involved the flexibility to use their own skills and judgment to adapt the flow to the business needs. For example, the task owner can perform the following actions:

- Repeat a number of activities if the initial results were not satisfactory - For example, a job applicant might be called in for a second interview if an additional manager wants the opportunity to speak to the applicant. In this case, the task owner will redo a task.
- Expedite the process - For example, a loan application might be dismissed at a certain point in the process without going through the final steps. In this case, the task owner will skip a task.
- Trigger subprocesses - For example, a doctor might order a blood test, because a patient is not responding in an expected fashion. In this case, the task owner will add an additional dependent task.

4.5.3 Business calendars

Business calendars are modeled in WebSphere Integration Developer to represent non-contiguous times and run in WebSphere Process Server wherever elapsed time (duration) is needed, such as in human task expiration or business process wait activities. Figure 4-24 shows the definition of a business calendar in WebSphere Integration Developer.

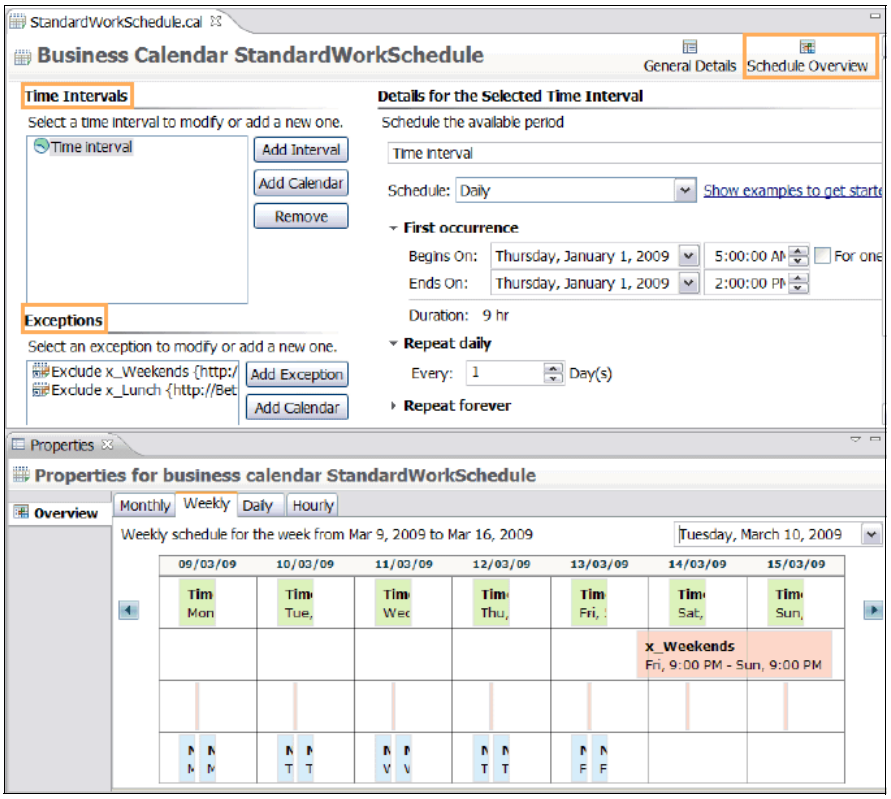

Figure 4-24 Business Calendar editor in WebSphere Integration Developer

Imagine that a human task must be completed in two days; however, a holiday occurs or a weekend occurs during this time. Using an appropriate calendar, you can ensure that this holiday or weekend is excluded when WebSphere Process Server calculates the elapsed time. In Figure 4-25, a business calendar is used to indicate the duration before a task is overdue.

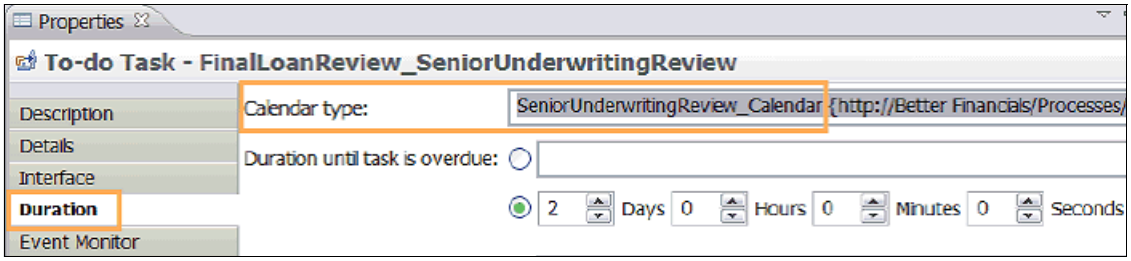

Figure 4-25 Selecting a calendar for a human task

Business calendars can also be modified at run time using the Business Calendar Manager widget (shown in Figure 4-26). Role-based access control is available to set proper permissions and allow business users to read or update existing calendars in the Business Calendar Manager.

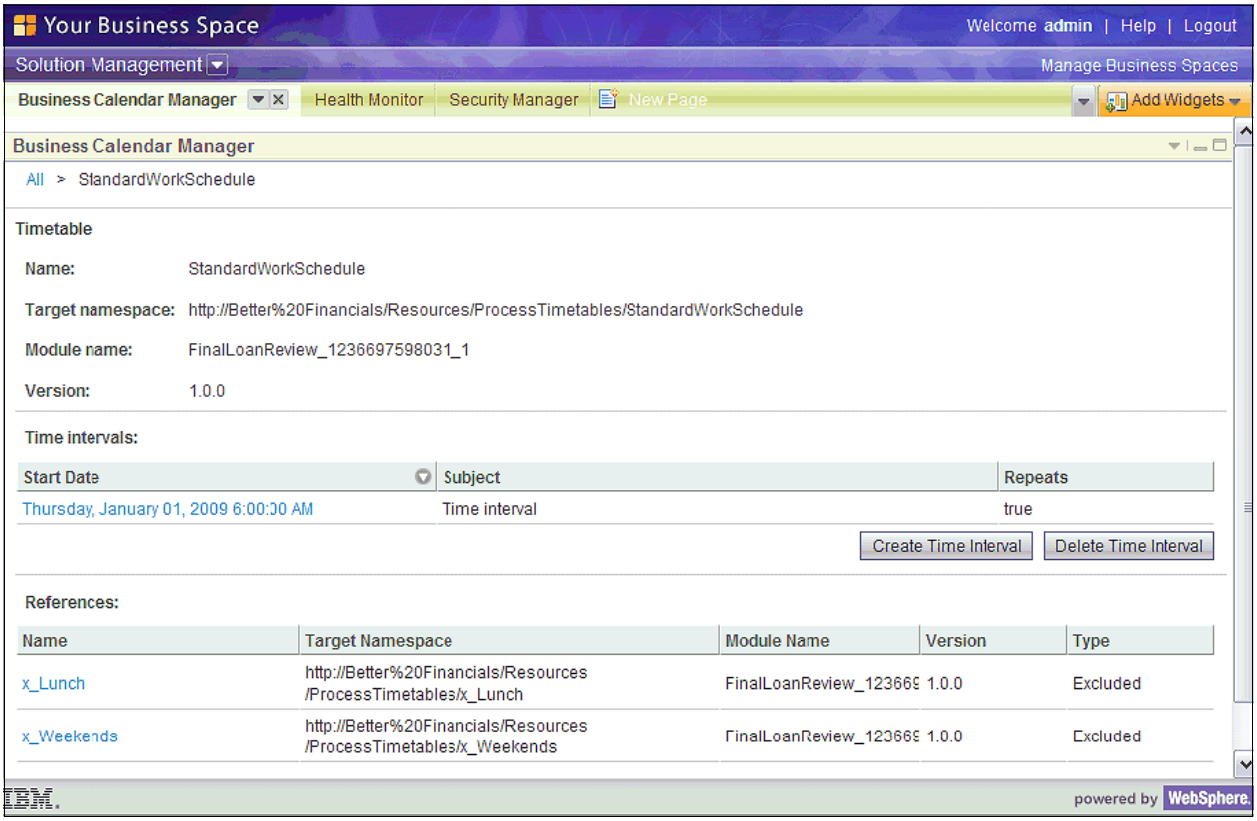

Figure 4-26 Business Calendar Manager

4.5.4 Integrated forms

Business users often use forms in BPM applications as input to start a business process or capture the progress of a business process. WebSphere Integration Developer and WebSphere Process Server integrate Lotus Forms capabilities for a richer BPM experience at both authoring time and run time.

Use the integrated Lotus Forms capability to generate forms-based clients

With WebSphere Integration Developer, the developer can use the integrated Lotus Forms capability to generate forms-based clients for existing human tasks. The generated form is based on the task interface definition and can be customized (shown in Figure 4-27). In addition, the developer can also create human tasks from an existing form and can create processes that are initiated by a human task using existing forms.

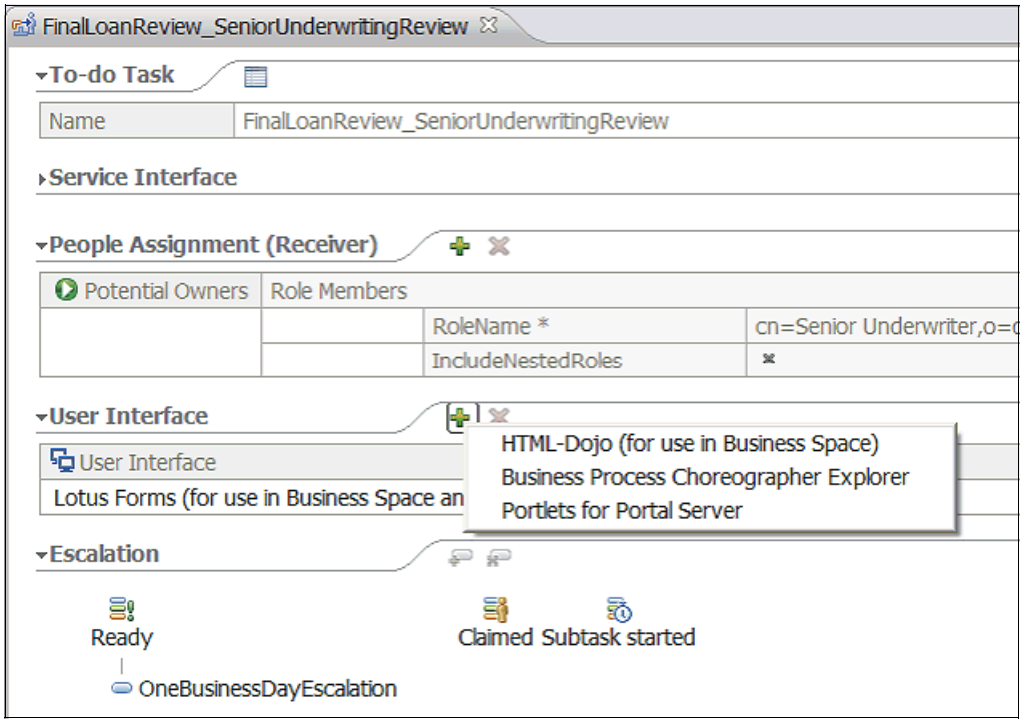

Figure 4-27 Forms generation for a human task in WebSphere Integration Developer

4.5.5 Audit trails of processes and tasks

Businesses often need to maintain an audit trail or record of processes. Audit events are raised when the state of a process or activity or a human task changes. Typical events include starting or stopping processes.

Events that are related to business processes and human tasks can be generated to Common Event Infrastructure (CEI), to an audit log, or both. The audit log events (shown in Figure 4-28) are written to the audit trail in the Business Process Choreographer (BPC) database, and CEI events can be written to the CEI database or to other destinations and monitored by applications, such as WebSphere Business Monitor, to aggregate information from events, display it in real time, and analyze historical data.

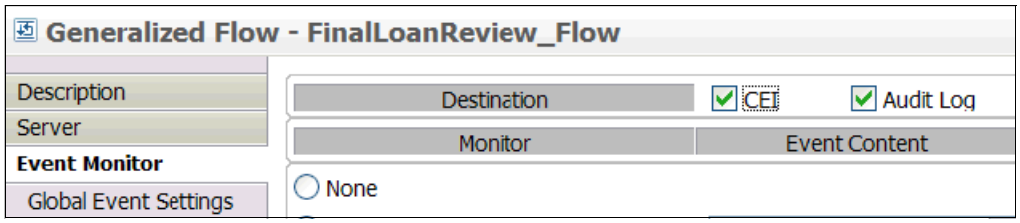

Figure 4-28 Auditing business processes

4.5.6 Federating staff repositories and participant substitutions

WebSphere Process Server leverages the Virtual Member Manager capabilities in WebSphere Application Server to provide advanced support for assigning individuals or groups to specific human tasks. Virtual Member Manager makes it easy to extend the number of attributes and factors that can be injected into the process of deciding who does specific human tasks.

Also called *delegation support*, this key capability allows the integration developer to inject additional support into the assignment process so that business users can more easily manage absences by having first-class support for substitution. Substitution allows a business user to specify whether someone is absent and, if absent, to identify a list of people as substitutes.

Automatic reassigning of tasks ensures that human tasks are not left waiting

The integration developer defines the substitution policy to be applied on a per-task template basis. At task definition time (Figure 4-29), the integration developer uses WebSphere Integration Developer to select the substitution policy. Depending on the selected policy, various criteria are applied at run time to compute the substitutes.

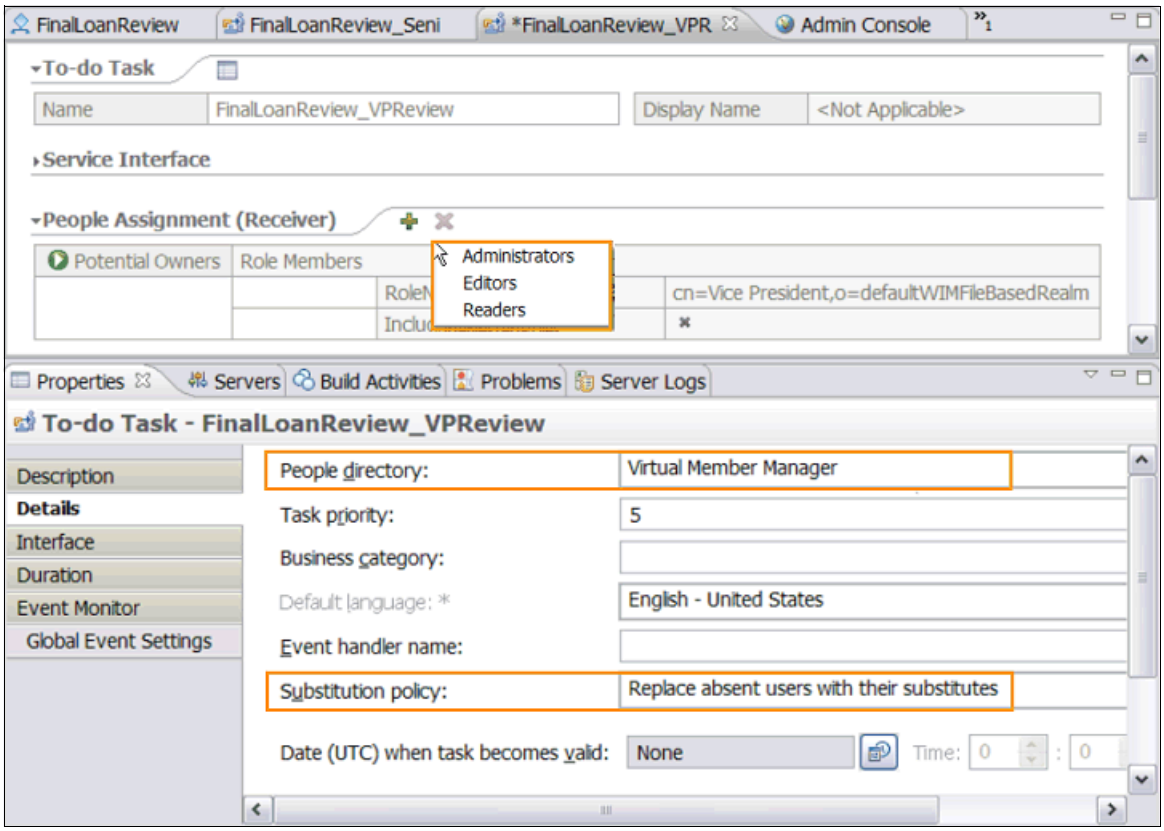

Figure 4-29 Delegation support for human tasks

4.6 Lowering the total cost of ownership

After you have deployed your BPM solution, you want to keep the resources that are required to maintain that solution to a minimum. WebSphere Process Server helps you manage processes by giving you more control over the administration of processes and activities, governance of process failures with unified failure management tools, and tools for monitoring and managing your production environment.

WebSphere Process Server also leverages underlying WebSphere Application Server network deployment technologies to provide high scalability, availability, and performance. By leveraging advanced clustering and failover techniques, WebSphere Process Server ensures a high level of process integrity and, with proper planning of your topology, helps ease your administration, maintenance, and deployment costs.

4.6.1 Administering business processes

Business processes can be administered through the BPC Explorer Web tool in WebSphere Process Server. BPC Explorer helps the administrator manage processes and activities in human tasks as well. It can be configured to apply role-based security so that only users with proper authorization can work with processes (shown in Figure 4-30).

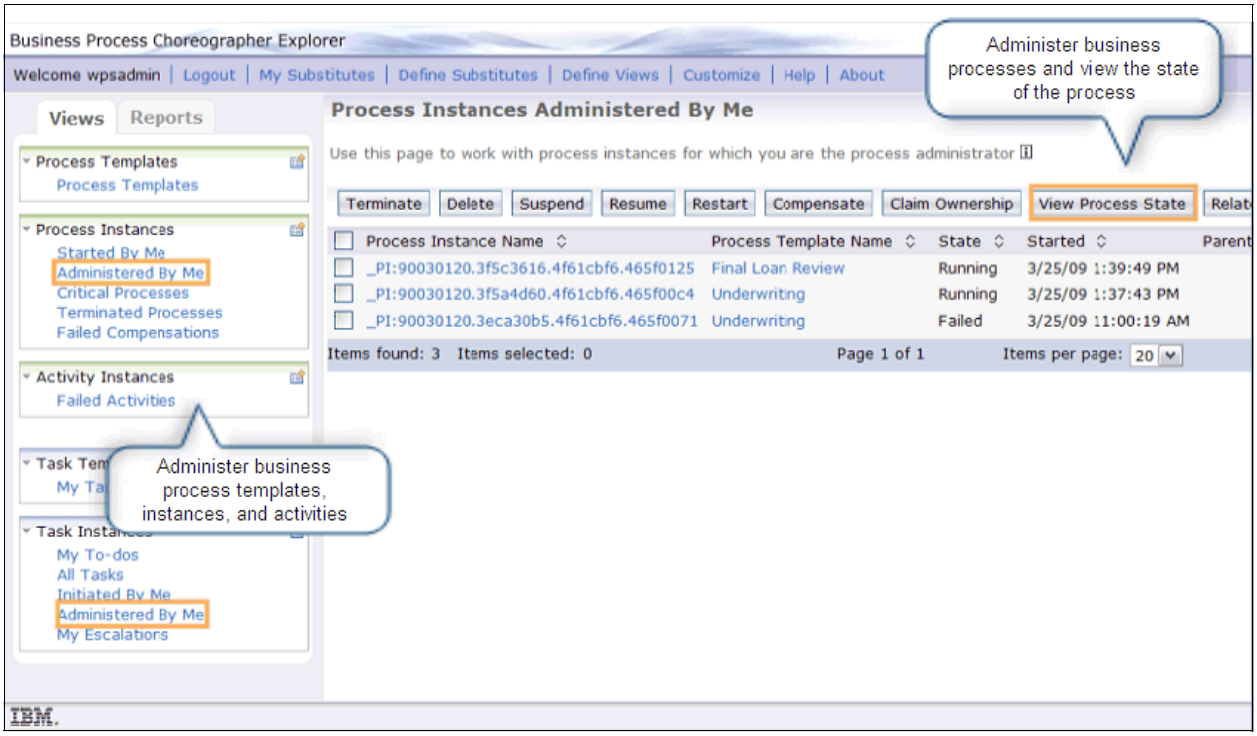

Figure 4-30 Business Process Choreographer (BPC) Explorer

As an administrator, you can see information about process templates, process instances, tasks, and associated data, and you can act on this information. You can perform advanced problem determination to diagnose process failures and can select activities to redo, skip, or invoke a subprocess. BPC Explorer has an optional reporting function that provides reports about the statistics of a process.

The Process State view (shown in Figure 4-31) gives a graphical representation of the process and its current state. An administrator can monitor the activities that the process executed and view details related to the specific activity. If an activity failed, the administrator can see details about the error and repair the activity.

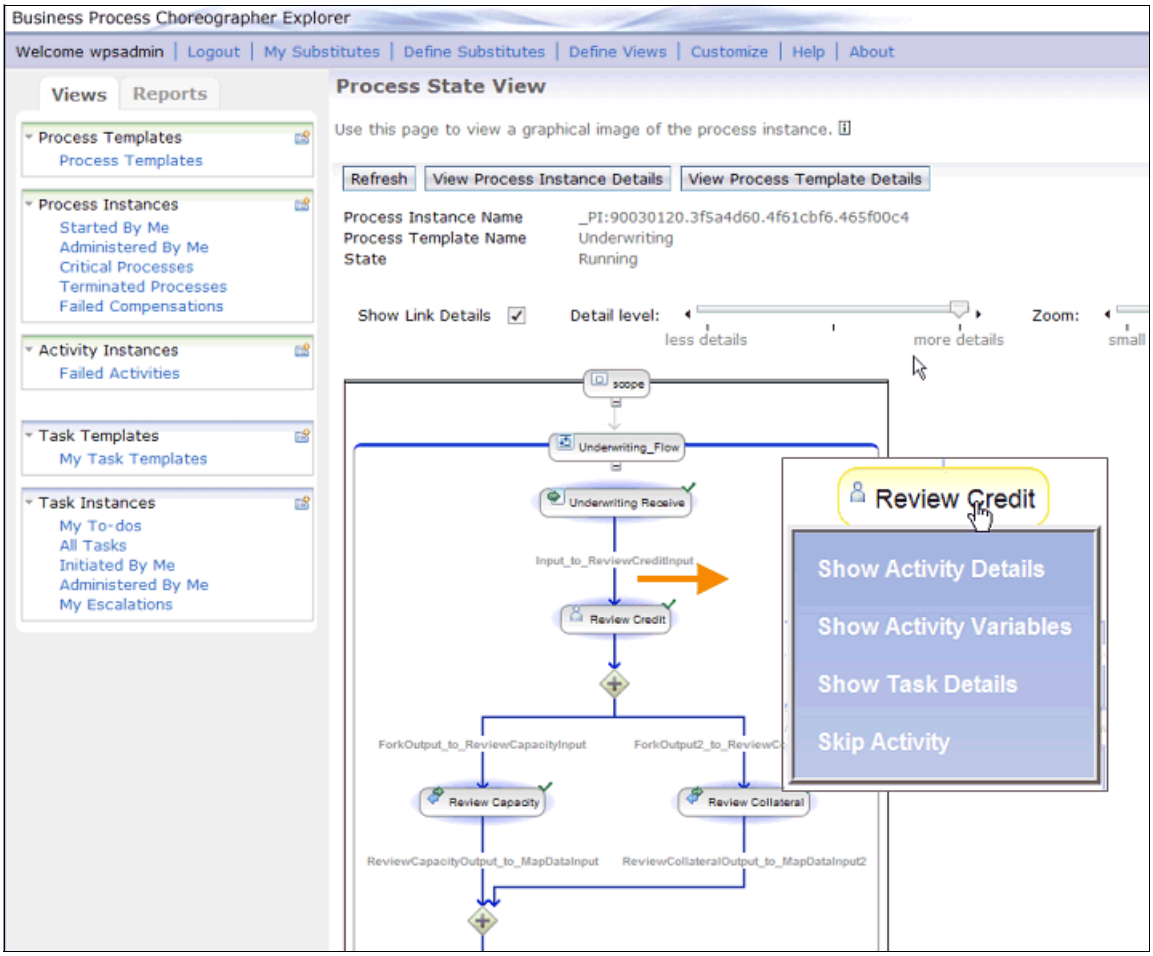

Figure 4-31 The Process State view in BPC Explorer

4.6.2 Managing failed processes

Planning a recovery strategy for handling failures is a critical part of deciding on a production environment and creating the appropriate topology for your applications. WebSphere Process Server provides tools that help you identify failures in your business processes and repair those failures effectively.

The Failed Event Manager (shown in Figure 4-32) is a graphical Web tool that is available to administrators who manage failed processes and messages in the system. Administrators use the Failed Event Manager to find and manage failed events on all of the servers in a complex production environment. The Failed Event Manager reports events that failed because of errors in SCA, Java Message Service (JMS), and stopped, terminated, or failed business processes. The interface enables administrators to see (and in some cases, edit) the data for a failed event, resubmit a failed event, and delete a failed event.

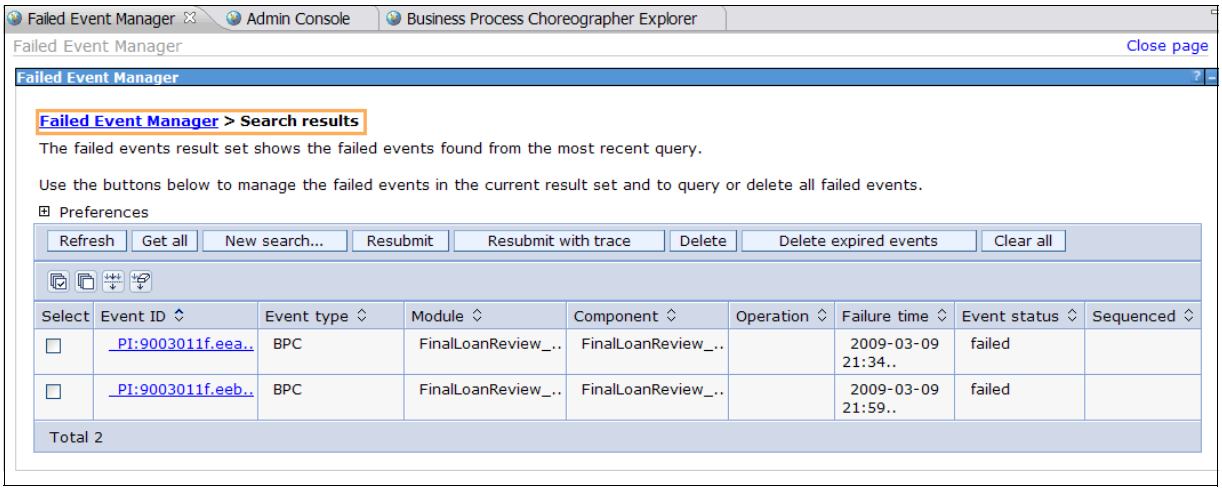

Figure 4-32 Failed Event Manager

The Failed Event Manager is integrated with BPC Explorer. The failed process can be opened from the Failed Event Manager and repaired in BPC Explorer (shown in Figure 4-33).

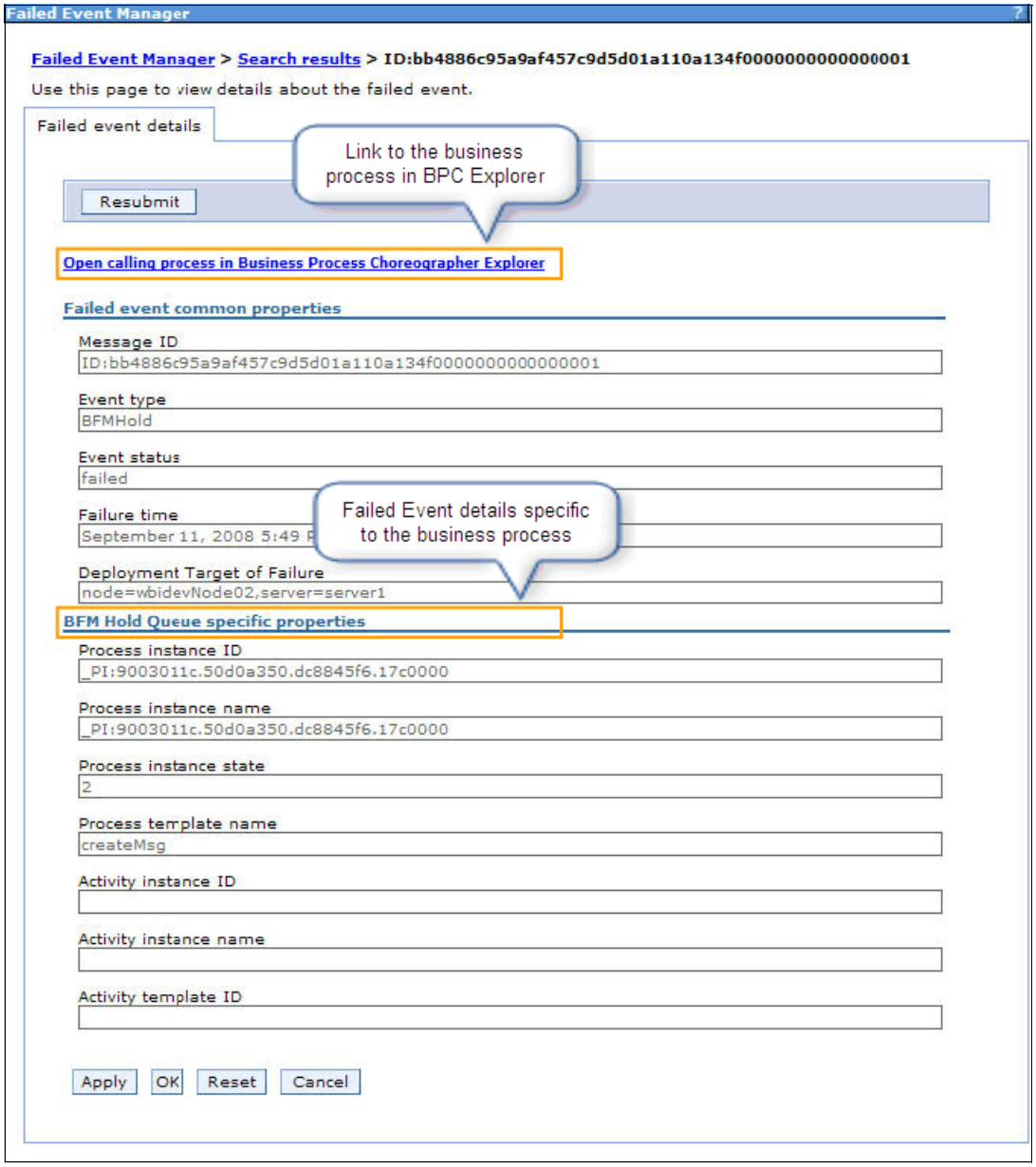

Figure 4-33 A failed business process in Failed Event Manager

4.6.3 Health monitoring

Monitoring business solutions in the IT environment is a critical activity of any administrative task. The Health Monitor widget provides a snapshot of the overall system health of your business solution, providing a single place from which an administrator can quickly assess the status of application servers, nodes, clusters, deployment environments, messaging engines and their queues, databases, system applications, and failed events.

An administrator can customize the Health Monitor to provide the status on a specific subset of system components (Figure 4-34). To provide a more restrictive view of the system, the administrator can also filter out certain components using wildcards, such as the asterisk (*).

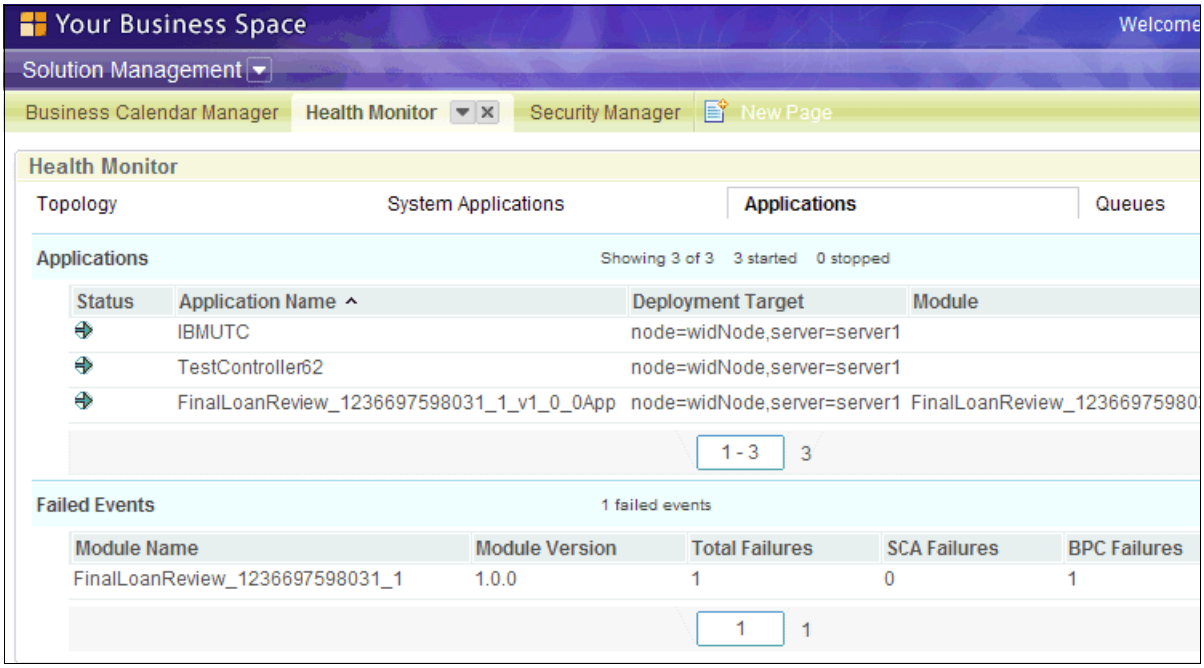

Figure 4-34 Health Monitor widget

4.6.4 Availability and scalability

Clustering is a key technique that you can use to improve the availability and the scalability of a WebSphere Process Server environment. With clustering, you can increase the availability of the system, which can ensure some level of continuity of service in case of failures. Clustering is also a way to accommodate additional workload scalability by making additional processes and systems available to run transactions.

Selecting an appropriate topology for your production environment depends on several factors, including the available hardware resources, the types of business processes that you plan to implement, your scalability requirements, and the administrative effort involved (refer to Table 4-1). The following table lists the topology patterns that WebSphere Process Server supports.

Table 4-1 Factors considered to build your topology

Factors to be considered	Single cluster topology	Remote messaging topology	Remote messaging and support topology
Number of clusters to maintain	One cluster for all components	► One cluster for applications and for the support infrastructure ► One cluster for messaging	► One cluster for applications ► One cluster support infrastructure ► One cluster for messaging
Hardware requirements	Can be implemented on limited hardware	More hardware required for distributed environments	Most hardware intensive

Factors to be considered	Single cluster topology	Remote messaging topology	Remote messaging and support topology
Long-running processes, state machines, and human tasks	Use should be minimal	Use must be balanced against resource availability	Ideal environment for interruptible processes, state machines, and human tasks
Administrative burden	Relatively small	Requires additional effort	Requires the most administrative effort
Scalability	Easiest to scale but all components are scaled at the same rate	► Messaging cluster scalability is limited ► All other components are scaled at the same rate	► Easiest to scale ► All functions are separated ► Messaging cluster scalability is still limited

In general, the Remote Messaging and Remote Support topology pattern is the most suitable production topology, but the choice ultimately depends on your unique requirements. As you plan for your production environment, carefully consider the advantages and disadvantages of each of the common topology patterns as outlined in the table.

4.7 Summary

WebSphere Process Server and WebSphere Integration Developer provide robust standards-based capabilities to implement, test, deploy, and manage BPM solutions. These products form the integral enabling component of the IBM BPM portfolio and are integrated with a broad range of connectivity technologies to extensively reach across heterogeneous systems in your enterprise. By linking business and IT, WebSphere Integration Developer and WebSphere Process Server contribute to a holistic BPM strategy.

5

Enabling BPM and BAM with the WebSphere Business Monitor

This chapter discusses enabling business process management (BPM) and business activity monitoring (BAM) with WebSphere Business Monitor. WebSphere Business Monitor can help you perform the following tasks:

- Achieve real-time, end-to-end process visibility in business processes and operations
- Create new dashboards, Key Performance Indicators (KPIs), and alerts with minimal IT involvement
- Proactively manage your business
- Ensure continuous business process improvements
- Accelerate time to value using powerful templates and accelerators

5.1 Introduction

Managers need up-to-the-minute insight on key operational metrics

The fundamental value of business activity management (BAM) is that it gives you real-time insight into how well your business is running. You receive this information in a timely manner so that you can identify problems and business opportunities and facilitate continuous business improvement and proactive corrective action, ultimately reducing costs and increasing revenues. To take timely action, you need to be alerted to operational information about unforeseen events that affect your customers or the bottom line. You also need to be made aware of long-term trends that identify strategic targets and factor in opportunities and competitive challenges.

5.2 Empowering the line of business

An essential component of business process management (BPM) is to enable the line of business (LOB) to play an active role in defining how the business processes should be managed. The scope of this role includes the ability to define the high-level business metrics (with WebSphere Business Modeler), view operational and strategic business activity using dashboards, be alerted to key situations, and use real-time data to improve business process definitions (also working with WebSphere Business Modeler).

Customize your dashboards without requiring IT to re-implement, test, and redeploy the monitoring solution

Business conditions change quickly for many reasons, such as responding to a competitor introducing new product lines, evolving to customers' expectations for improved service, and dealing with product recalls. Organizations must respond quickly to business conditions like these to be successful.

WebSphere Business Monitor (shown in Figure 5-1) raises the bar of empowerment so that business users can customize the monitoring solution and dashboard to react to these changes rapidly, without requiring IT to re-implement, test, and redeploy the monitoring solution, as defined by a monitor model. Business users can modify what is displayed, add new KPIs or change the thresholds on existing ones, and define alert situations and determine to which alerts business users want to be alerted, without discussing changes with a developer or portal administrator. This customization not only provides flexibility to the business, but it relaxes the need for IT to meticulously define all KPIs and alerts up front, enabling businesses to react quickly to changing conditions. At the same time, the routine workload on IT is reduced, enabling them to focus on more strategic projects.

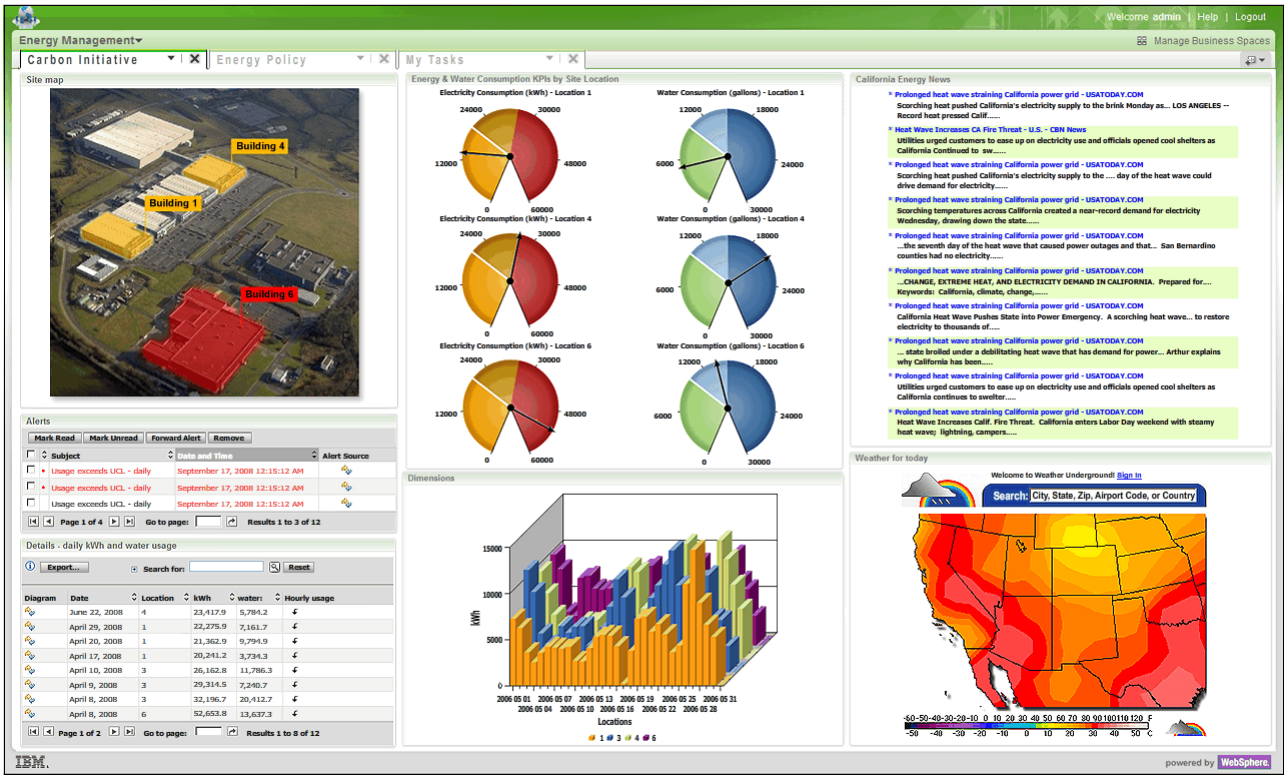

Figure 5-1 WebSphere Business Monitor dashboard in a business space

Business spaces integrate monitoring capabilities with other process content for comprehensive management of business processes. Business users may choose to use a default dashboard provided by IT or build one themselves. For example, you might want to build a business space dashboard (or business space) with a unique view configuration and make it accessible only by a particular group of users. You can name this dashboard, select which widgets to include, and arrange them in a unique layout.

Furthermore, business users can select which widgets cooperate with one another (that is, indicate how a change in one widget affects another widget). Business users can also combine widgets that are supplied with other WebSphere Dynamic Process Edition products with business monitoring widgets to optimize the management of their business environment. In addition, business spaces include templates that enable business users to easily create role-oriented business spaces to match the needs of their organization.

5.2.1 Critical insight throughout the business day

Business users do not typically look at a WebSphere Business Monitor dashboard continuously throughout their day using a desktop monitor. They require business insight delivered to where they work, wherever that might be. In addition to Web-based business dashboards, business users can improve their responsiveness by gaining business monitoring insight through common business applications and devices. For example, you can access and monitor key performance measures from the following devices:

- Mobile devices, such as BlackBerry® smart phones and the Apple® iPhone™
- IBM Lotus Notes® collaboration software
- The IBM Lotus Sametime® instant messaging client
- Desktop gadgets
- Common business software, such as Microsoft Excel

Additionally, WebSphere Business Monitor provides a rich set of Representational State Transfer (REST) programming interfaces, facilitating the development of custom clients. For example, developers can enable BAM insight from instant messaging clients, such as AOL® Instant Messenger.

5.2.2 Creating and subscribing to business alerts

WebSphere Business Monitor can alert business users to a particular situation (for example, a KPI has exceeded a threshold) by sending a notification to a business dashboard, an e-mail ID, pager, or personal digital assistant (PDA) (shown in Figure 5-2). With this notification, business users can react to this business situation in a timely fashion so that you can prevent problems or take advantage of opportunities immediately. Business users can set up new alerts, change the mode in which you are alerted, and subscribe to predefined alerts, all from your dashboard.

For example, the Order Fulfillment manager is alerted by e-mail when the average time taken to fill orders exceeds a specific duration. However, this manager now wants to be alerted by pager when a Gold customer order exceeds a specific duration to fill. By using the Alerts Manager in WebSphere Business Monitor, the Order Fulfillment manager can subscribe to alerts of interest and specify the notification mechanism, without involving IT.

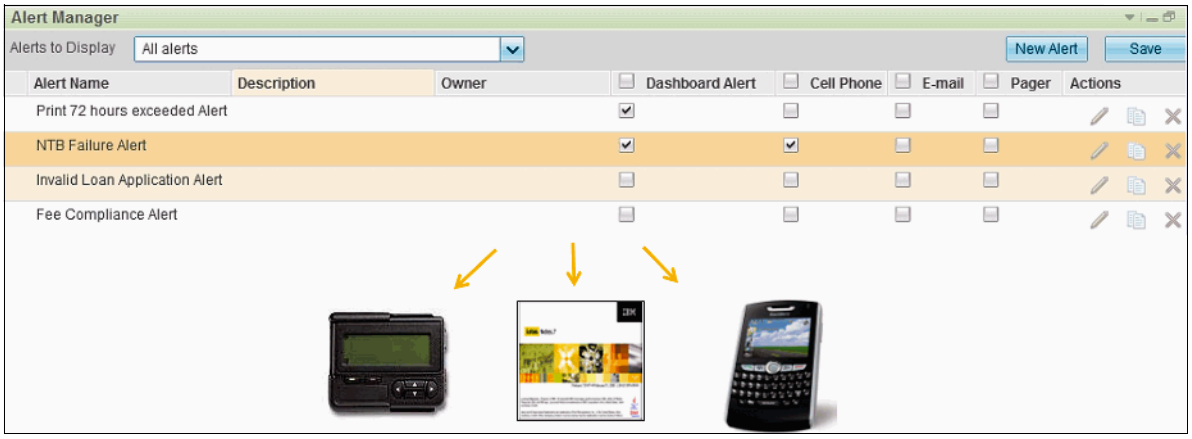

Figure 5-2 Subscribing to alerts using the Alert Manager in WebSphere Business Monitor

The Order Fulfillment manager might also want notification for other situations that have not been predefined, for example, when the Order volume exceeds the expected thresholds early in the day. Using the Alerts Manager, the manager can create alerts (shown in Figure 5-3).

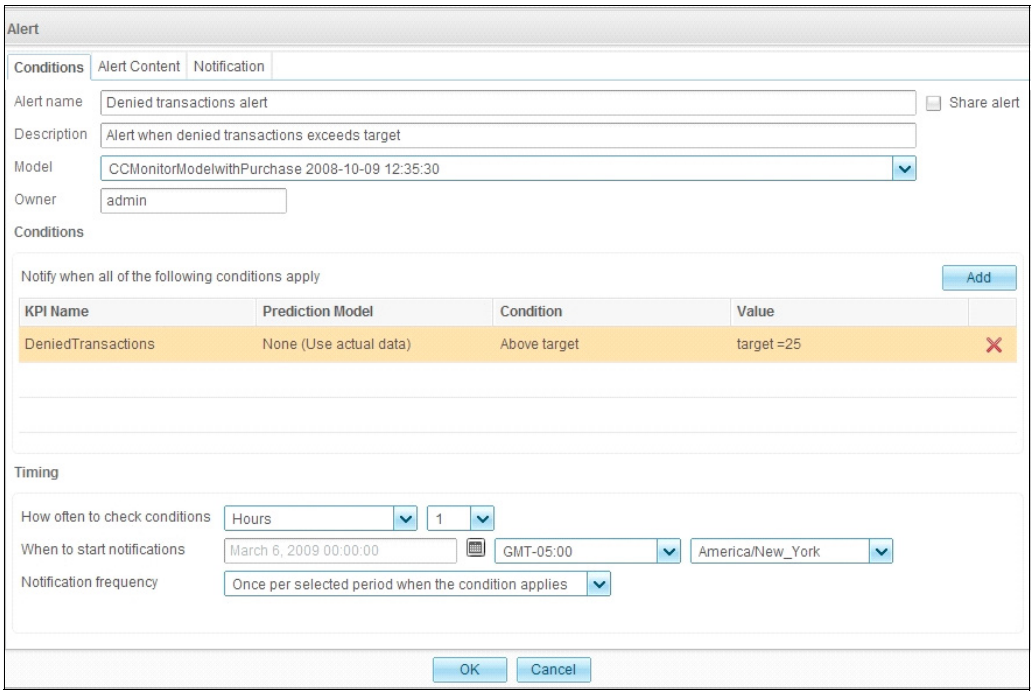

Figure 5-3 Creating an alert using the Alert Manager in WebSphere Business Monitor

5.2.3 Personalizing and creating KPIs on the fly

A key theme of BAM is discovery: analyzing data to gain business insight that otherwise might be unrealized. With the KPI Manager, business users can select one or more KPIs and modify the display mode (Table view, Gauge view, and so on) and the visual characteristics (color range spectrums, sizes, layout format, and so on). Figure 5-4 shows the KPI Manager.

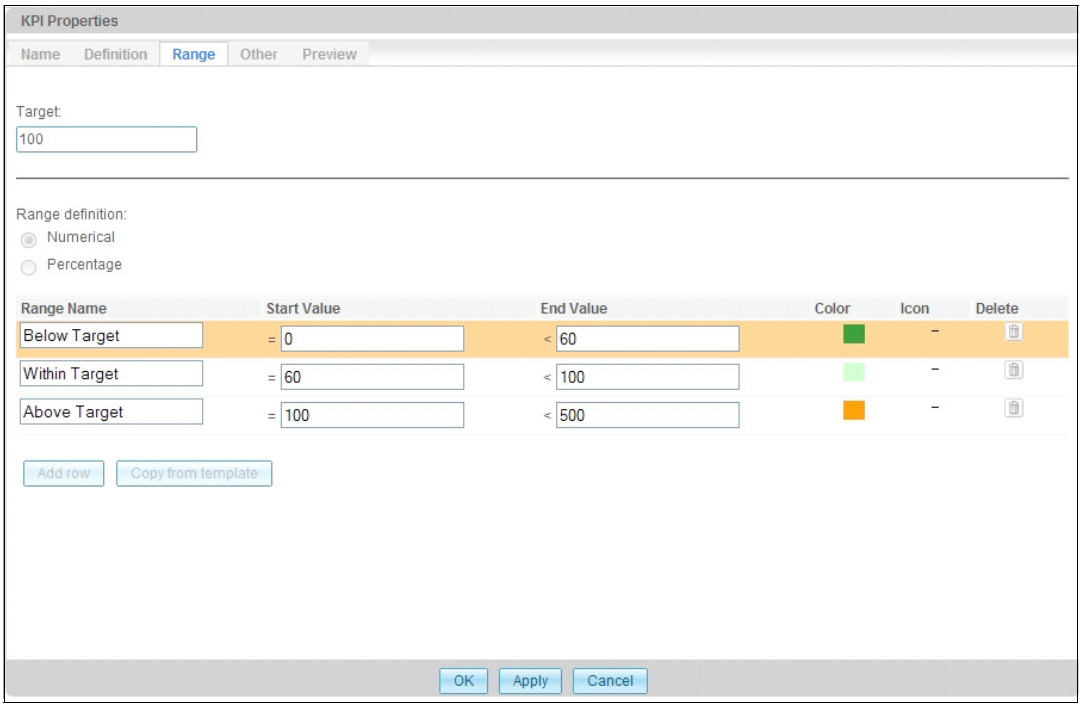

Figure 5-4 Modifying KPI properties using KPI Manager

As the business environment changes, KPI thresholds often need to change too. Using the KPI Manager, you can modify KPI thresholds so that you can move their success targets and evaluate various what-if scenarios without asking IT to update and redeploy the monitor model.

For example, a business user deems that the Order Fulfillment Duration threshold is too high. This leader lowers the threshold value and assesses how well the business performs given the same incoming events. If the business is not meeting the new threshold, the leader can ask business analysts to determine how the process can be improved to ensure the new goals can be achieved.

In addition, as you assess the state of the business, business users might realize that a new, yet-to-be-defined KPI might be helpful. With KPI Manager, authorized users can define, copy, and update KPIs. New KPIs can be based on correlating data from existing KPIs or on aggregations of business metrics. Figure 5-5 shows the interface for creating a KPI.

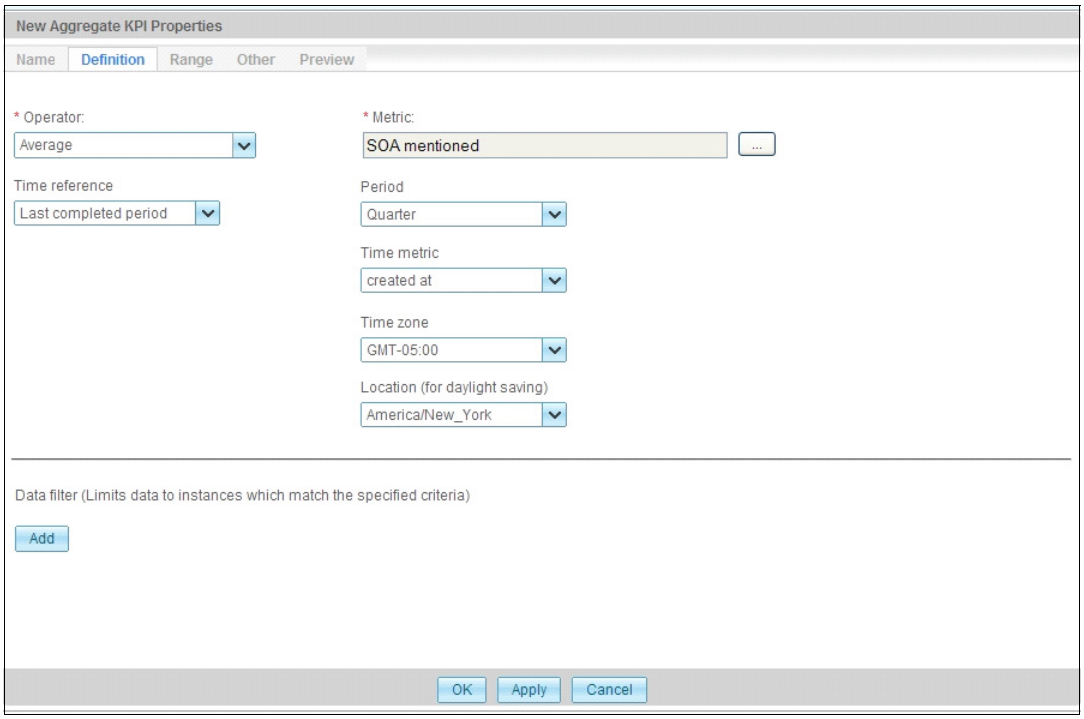

Figure 5-5 Creating a KPI

5.2.4 Accessing KPI history and projecting future KPI values

One of the key benefits of WebSphere Business Monitor is that, in addition to enabling the viewing of real-time metrics, it helps business users understand the historical variation for additional insight. Business users can view the variation of a KPI (KPI history) over flexible time periods, leverage this history for predicting future KPI values, and create alerts based on predicted future KPI values.

Current, historical, and future insight facilitates the ability to take focused, effective action

For example, while creating a staffing plan for the order-processing center, business users might want to understand the order trends over the past six months and predict future values based on these trends. Using the KPI History and Prediction widget (shown in Figure 5-6),

you can control KPI history and prediction settings and view historical variances and predicted future values.

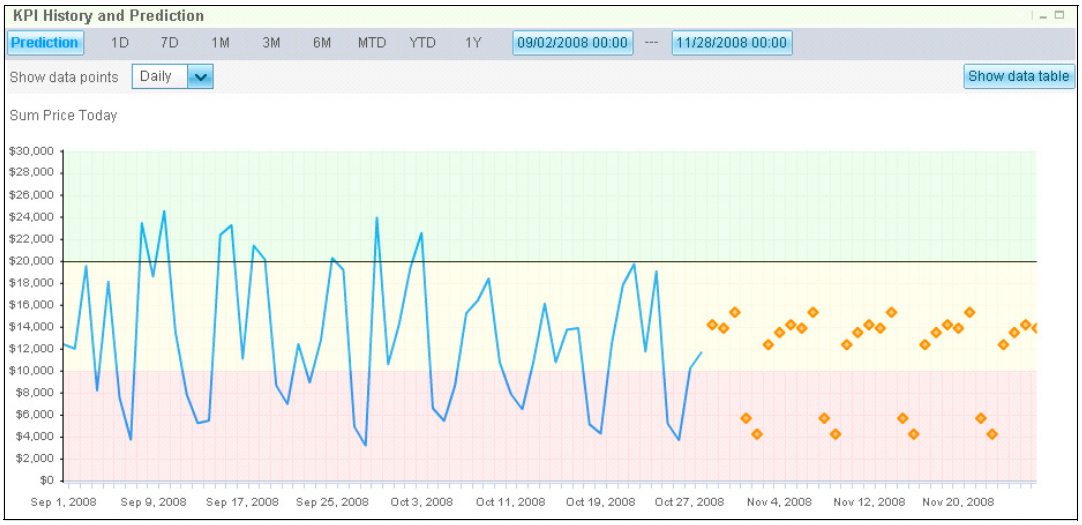

Figure 5-6 Viewing KPI history and predicted values

To be made aware of potential future business anomalies and take proactive mitigating action, you can create alerts that notify the business users when predicted values deviate from baselines that you defined. For example, you might want to know when the average daily order volume 30 days from now is projected to deviate from norms. This powerful capability enables business users to react proactively to potential business situations that can be detected this way so that you can prevent problems even before they occur.

5.2.5 Monitoring and managing human tasks

Human workers are an important factor in the success and efficiency of processes. WebSphere Business Monitor provides a set of configurable views to display human tasks to better assess workloads, identify bottlenecks, and redirect workload to prevent backlogs (shown in Figure 5-7). Human tasks can be Business Process Execution Language (BPEL) tasks orchestrated by WebSphere Process Server, or stand-alone human tasks in the monitored system.

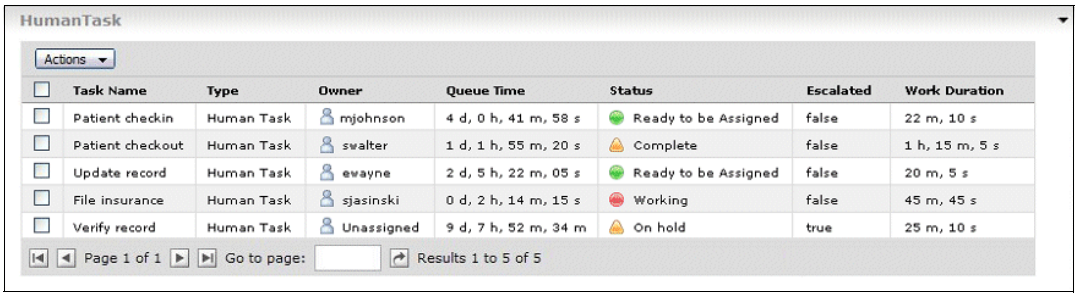

Figure 5-7 WebSphere Business Monitor Human task widget

With the WebSphere Business Monitor Human Task widget, business users can view all WebSphere Process Server human-task events that are related to particular monitor models. You can also choose which properties of those human-task events to show or hide, as well as filter and define properties that can be sorted. You can also assign, claim, release, or transfer tasks, depending on the accessibility that you were granted.

When using WebSphere Process Server, business users can use business spaces to combine WebSphere Business Monitor human-task capabilities with capabilities that WebSphere Process Server provides to manage human workload holistically (shown in Figure 5-8). For example, business users can create new tasks and manage their own and that of the team.

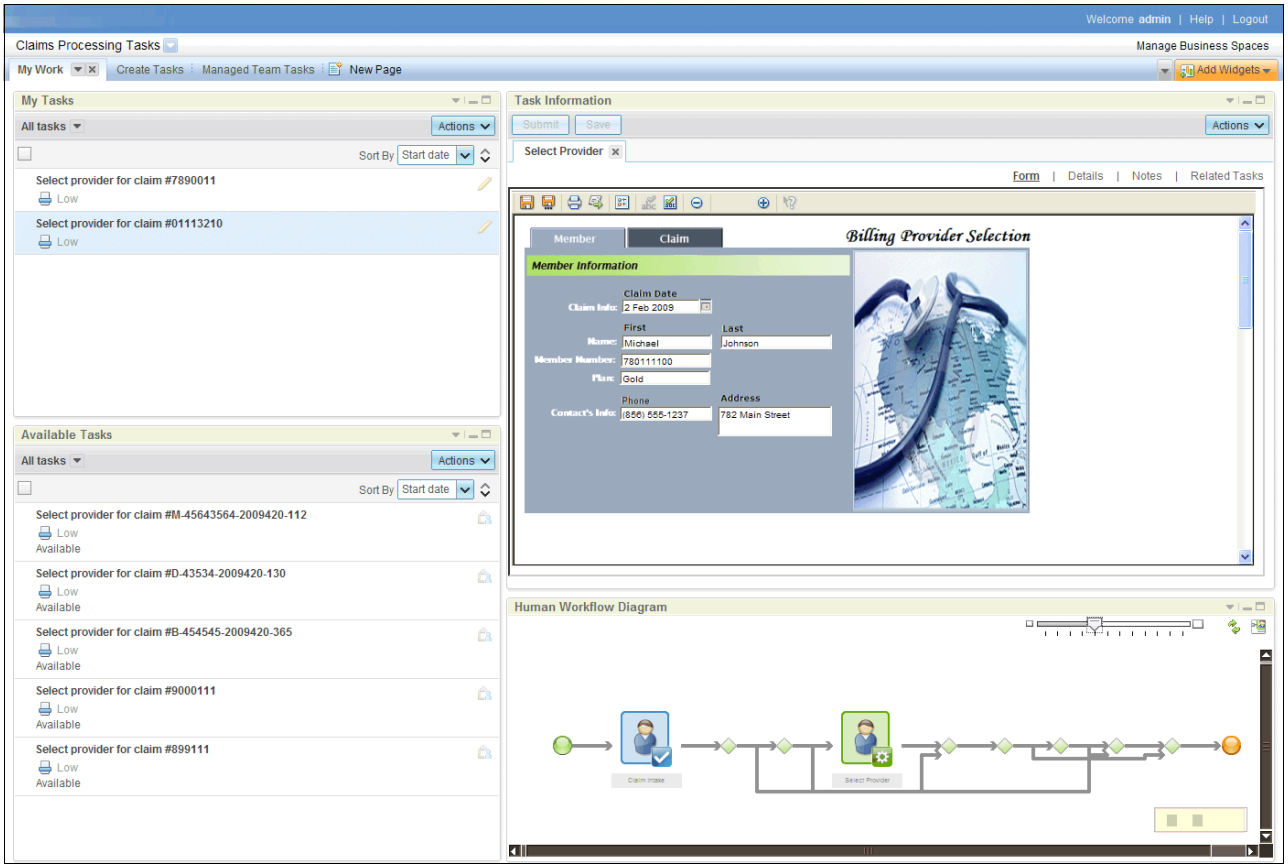

Figure 5-8 Workload and task management with WebSphere Process Server and WebSphere Business Monitor using business spaces

5.2.6 Business problem root-cause analysis

Business users can now view applicable process instances for KPIs to more easily determine the root causes of business problems. In addition, for greater insight into business performance trends when performing historical analyses, business users can view applicable process instances as they are related to specific dimensions.

Improved capability for root-cause analysis

This capability enables business users to identify problematic situations and immediately assess the details behind the situation, for greater insight into the problem and its solution. For example, the Order Fulfillment manager might determine that the fulfillment time for today's orders is not meeting service-level agreements. The Order Fulfillment manager can easily see today's orders to understand what is causing the problem, which enables focused action that will correct the situation. Figure 5-9 shows how you traverse from a KPI to the related process instance details, starting with the instances.

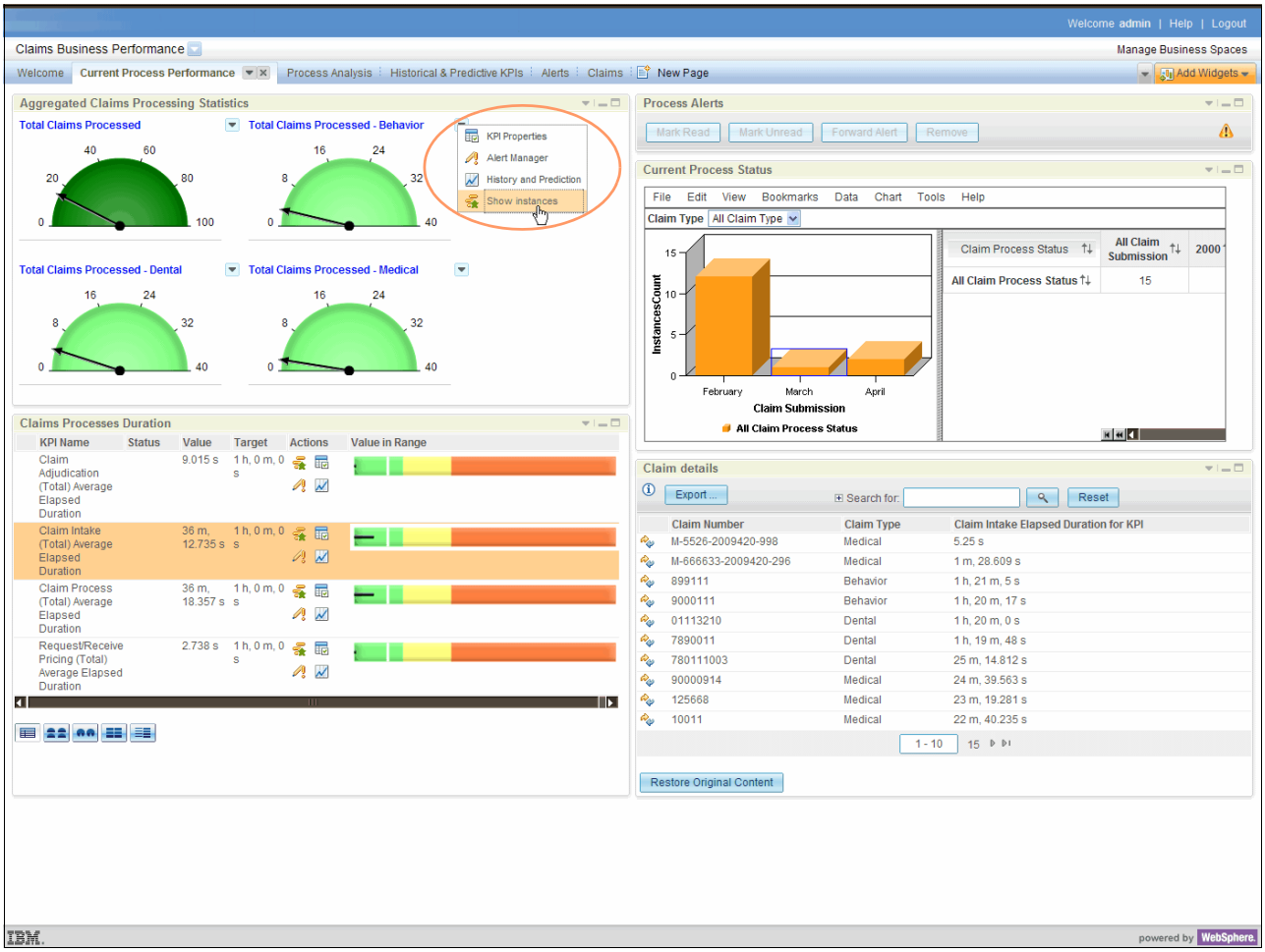

Figure 5-9 KPI show instances

Figure 5-10 shows how you traverse from a KPI to the related process instance details, showing you the instances updated.

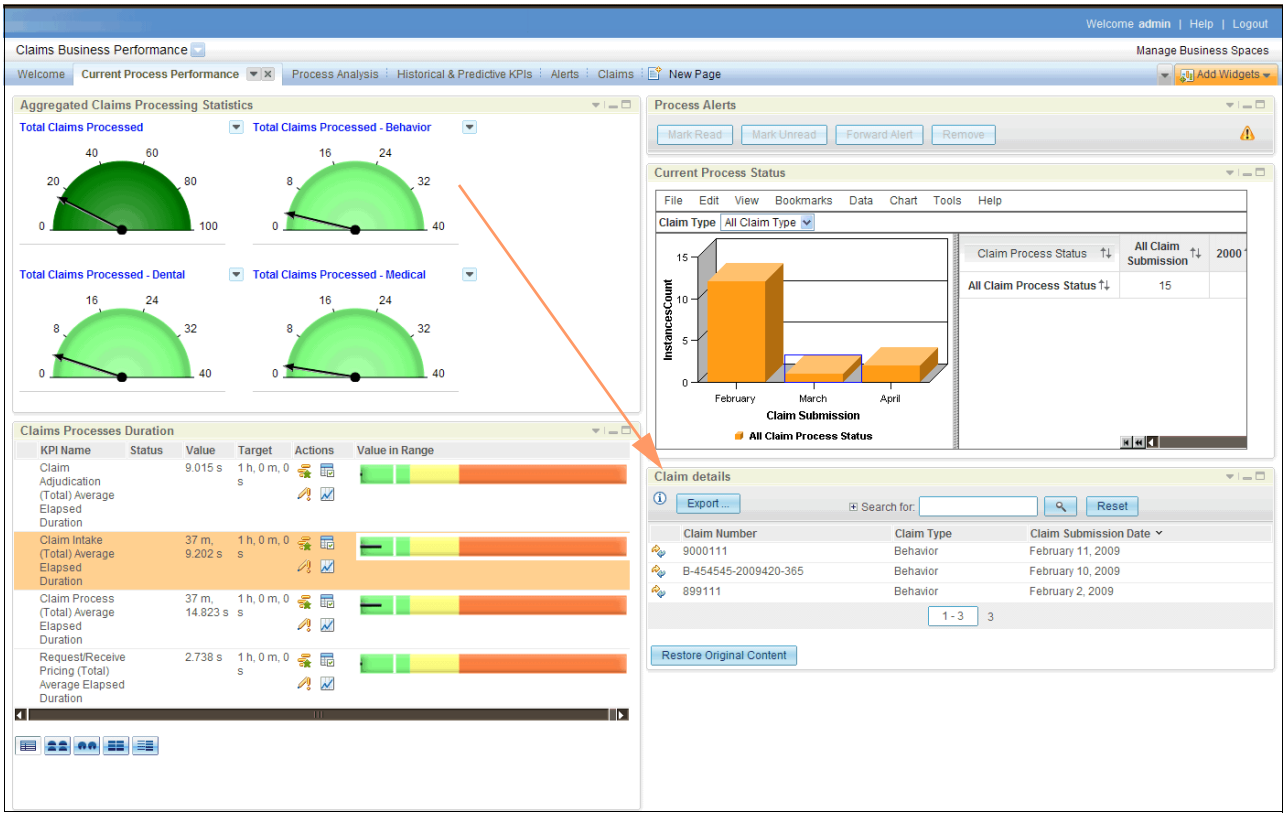

Figure 5-10 KPI show instances - instances updated

5.2.7 Using monitor data for reporting

Business users often want to take snapshots of the critical business data that WebSphere Business Monitor gathers and displays so that they can show business performance, in the form of business reports, to a broad audience that is already familiar with business intelligence reporting. Additionally, business users might want to use advanced business intelligence to uncover underlying trends. WebSphere Business Monitor includes IBM DB2® Alphablox to provide historical data structure and predefined business analytics. Without additional software, you can combine real-time insight with business analytics from within a business space.

For snapshot reporting and advanced business intelligence, reporting tools (for example, IBM Cognos® 8 Business Intelligence) can use the open data architecture of WebSphere Business Monitor, combined with an online analytical processing (OLAP) cubing service, such as IBM InfoSphere™ Warehouse. Cognos 8 Business Intelligence, for example, provides a data-mapping layer and metadata bridge to logically map to the WebSphere Business Monitor data that is exposed using a cubing service. Figure 5-11 shows an example report.

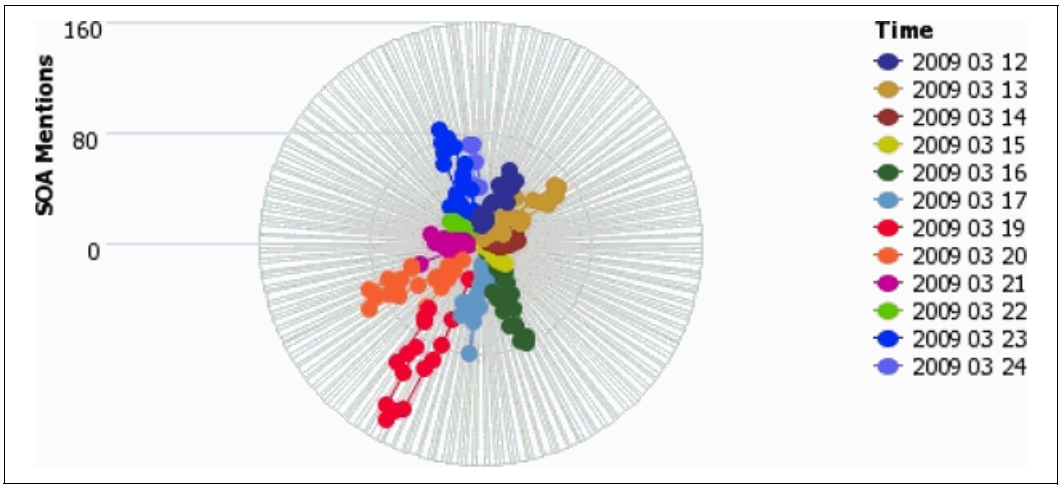

Figure 5-11 A Cognos 8 Business Intelligence report on WebSphere Business Monitor

Figure 5-12 shows the topology.

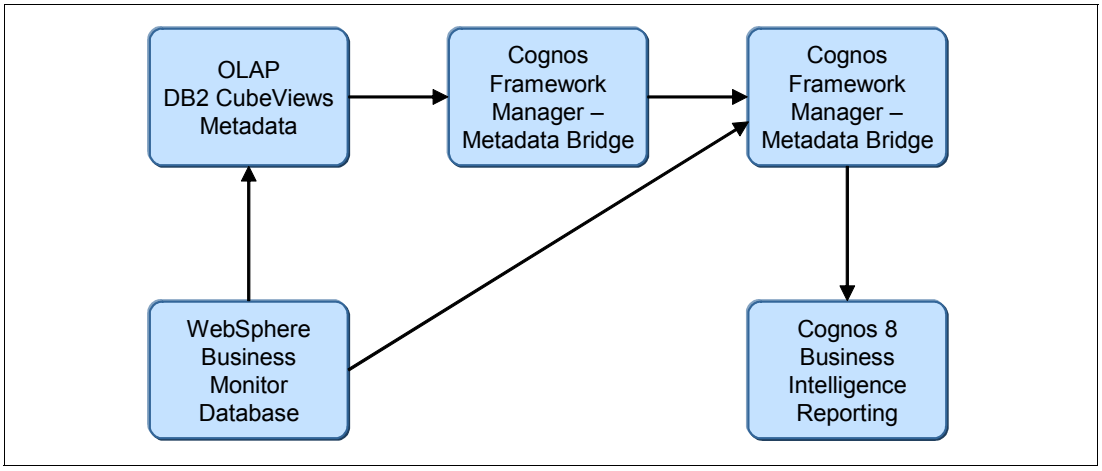

Figure 5-12 Using WebSphere Business Monitor data with Cognos 8 Business Intelligence

5.2.8 Quickly test and monitor business processes

Easily test business processes without requiring IT

For certain human-centric process scenarios, business users are empowered to go directly from modeling in WebSphere Business Modeler to deploying on the WebSphere Process Server and (optionally) WebSphere Business Monitor server environments. A pre-configured business space that is created as part of deployment can be used immediately to run, manage, and monitor processes, enabling business users to more easily define and test business processes, including the business monitoring of those processes, without requiring IT involvement. Figure 5-13 shows how you initiate a test of a manufacturing production site selection process.

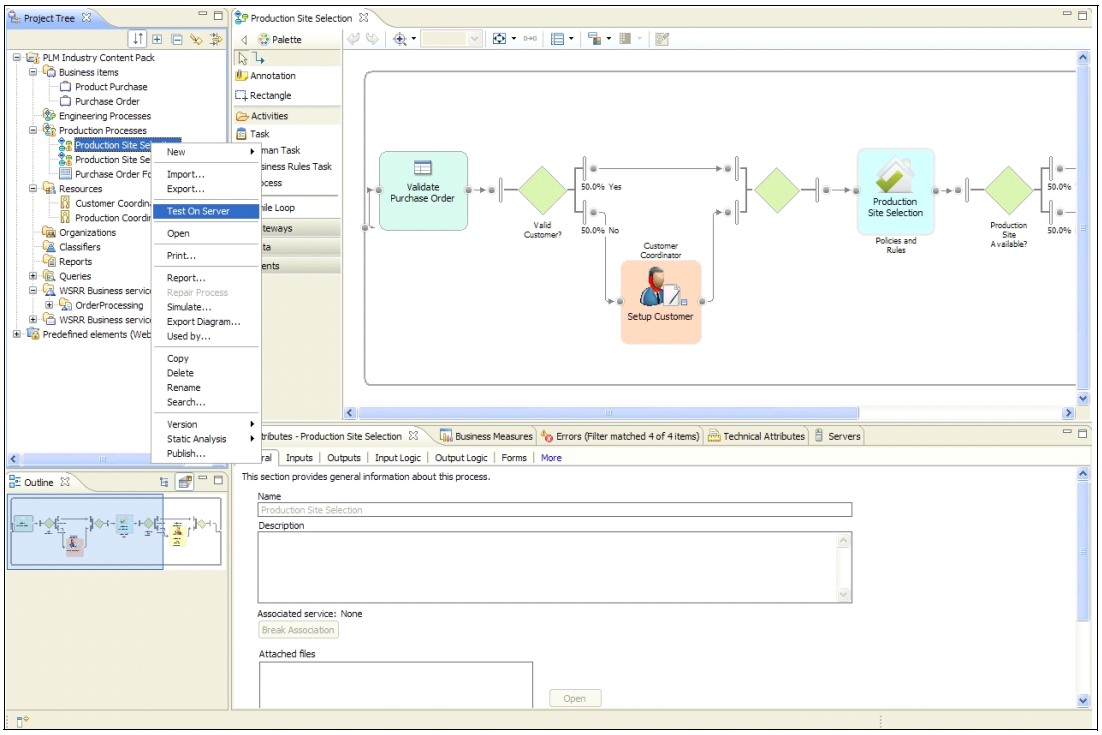

Figure 5-13 Testing a business process

5.3 End-to-end process visibility

To improve business results, business users must be able to see into all aspects of the process. For example, during an order-to-cash process, it is important to know not only how much time a supplier took to fill the order, but also how much time it took to invoice the customer. WebSphere Business Monitor provides this end-to-end visibility so that you can decide to expedite invoicing when there are supplier delays filling orders, ensuring that the overall process time meets customer service level agreements.

To effectively monitor a business, a monitoring solution must be able to use events from all relevant event-emitting applications, processes, or data-driven solutions. Instrumenting a heterogeneous monitoring environment can be daunting without a standardized event infrastructure and the tools to gather events.

In addition to monitoring Common Base Events from WebSphere Process Server and WebSphere Enterprise Service Bus, WebSphere Business Monitor facilitates BAM implementations by providing first-class, ready to use support for WebSphere MQ Workflow events, FileNet Business Process Manager events, WebSphere Message Broker events, WebSphere DataPower® XI50 events, and XML Schema Definition (XSD)-based events. WebSphere Adapters can also be used to get event information from Enterprise Information Systems (EISs), such as SAP, and even create user-defined functions to pull data from other systems.

Furthermore, WebSphere Business Monitor REST application programming interfaces have been extended to provide a new option for developers to make data available to WebSphere Business Monitor.

5.3.1 Monitoring WebSphere Process Server and WebSphere Enterprise Service Bus applications

Organizations can easily monitor WebSphere Process Server and WebSphere Enterprise Service Bus applications. Graphical tools enable developers to instrument applications to provide appropriate information for business activity monitoring and creating and deploying business monitoring solutions, without requiring programming.

5.3.2 Improving insight with WebSphere Business Events

A business event is an electronic signal or message that indicates that a change in the state of the business has taken place and occurs within a business context. Business context is the combination of time (*during working hours*), population (*for Platinum customers*), activity (*change address*), state (*red alert state*), space (*within Chicago*), or other interrelated attributes that provide a backdrop in which patterns of events can be evaluated and actions can be taken.

Business event processing (BEP) is the ability to sense when an event or event pattern has occurred or not occurred, indicating an actionable business situation, and to coordinate the right response at the right time. BEP provides capabilities and tools to define and detect business events for greater visibility and a more rapid response to opportunities and threats. Individual events might not be significant in isolation. However, BEP aggregation and correlation capabilities can find patterns and trends that would otherwise be undetectable.

Find patterns and trends that would otherwise be undetectable

For example, in a banking scenario, the combination (in a short period of time) of a user password change, a change of address, and a large withdrawal can be captured and correlated to indicate an actionable situation that might require an investigation of fraud or the withholding of the withdrawal.

WebSphere Business Monitor and WebSphere Business Events are highly complementary. When WebSphere Business Events discovers an actionable situation, it can generate notifications in the form of events for WebSphere Business Monitor. In turn, WebSphere Business Monitor can generate events for WebSphere Business Events when, for example, the value of a KPI exceeds or is predicted to exceed a threshold (shown in Figure 5-14).

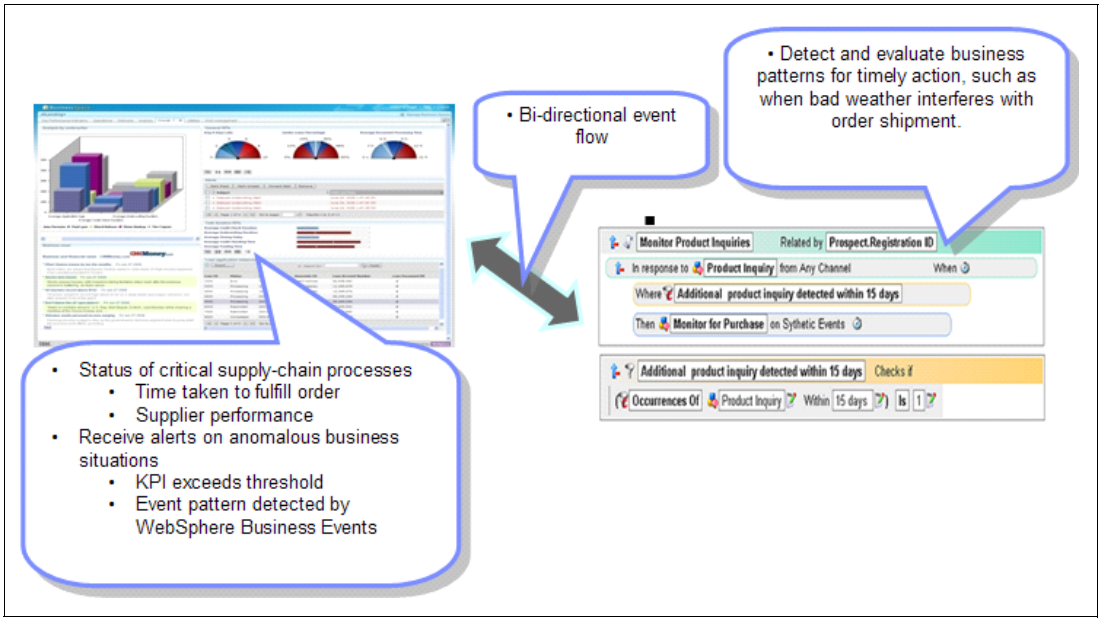

Figure 5-14 Achieving increased insight with WebSphere Business Events and WebSphere Business Monitor

5.3.3 Monitoring applications with WebSphere Message Broker

WebSphere Message Broker enables information that is packaged as messages to flow between different business applications, ranging from large traditional systems through to unmanned devices, such as sensors on pipelines.

Because developers can configure message flows to emit event messages that can support transaction, auditing, and business process monitoring without modifying the message flows, existing production message flows are enabled easily and unintrusively. Figure 5-15 shows how you monitor WebSphere Message Broker flows.

Monitoring activity in WebSphere Message Broker now includes improved visibility of business changes that occur inside the processing of a message flow, as well as access to business-relevant data, such as the amount of an item in a purchase order. With WebSphere Message Broker V6.1.0.3 or later, events can be emitted each time a message passes through a terminal on a node. A terminal event reveals any significant occurrence inside a message flow.

WebSphere Message Broker provides the following types of events:

- **Terminal events** - Any terminal in a message flow can be an event source. If the event source is active, it emits an event each time a message passes through the terminal.
- **Transaction events** - Each input node in a message flow contains three events sources, in addition to any terminal events.

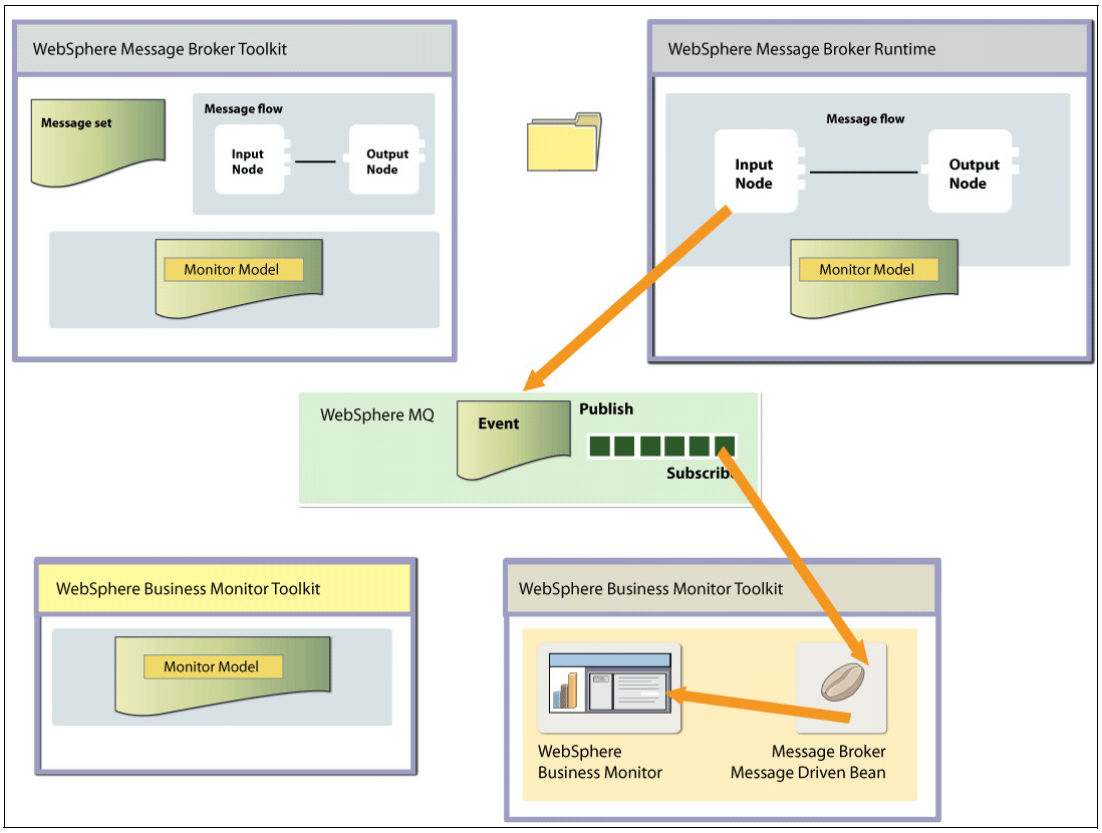

Figure 5-15 Business activity monitoring with WebSphere Message Broker

5.3.4 Monitoring FileNet processes

Because IBM FileNet Business Process Manager is the key environment for content-centric BPM solutions, it is important that WebSphere Business Monitor provide first-class support to monitor FileNet-based processes (shown in Figure 5-16). FileNet provides a Common Base Event adapter that retrieves FileNet Process Engine events, transforms those events into Common Base Events, and transmits them to the WebSphere Business Monitor server. A monitor model that is tailored to monitor FileNet Business Process Manager processes provides a workflow monitoring context, a work item monitoring context, and several predefined measures (processing time, workflow maps, queues, and so on). Many native FileNet Business Process Manager event definitions (for workflows, work items, and activities) are also available for use in WebSphere Integration Developer and WebSphere Business Monitor.

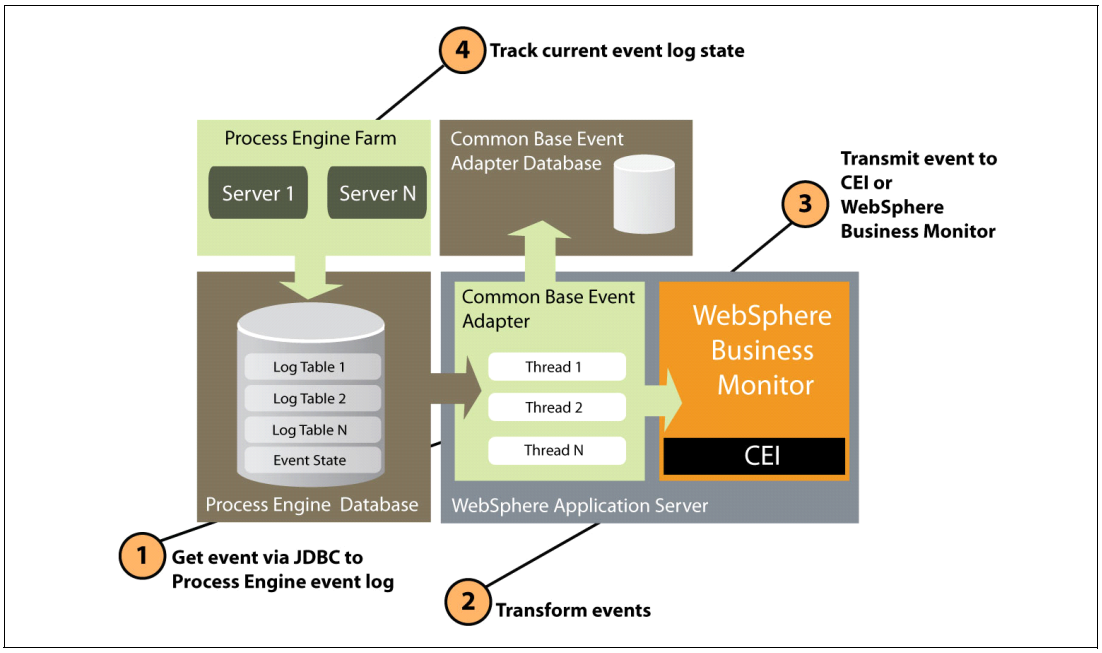

Figure 5-16 Steps to monitoring FileNet-based processes

5.3.5 Monitoring WebSphere MQ Workflow processes and applications

Although IBM highlights WebSphere Process Server as a strategic server technology for running process flows, many WebSphere MQ Workflow users must monitor their process environments while they plan for and ultimately migrate to WebSphere Process Server. In response, WebSphere Business Monitor provides first-class support for WebSphere MQ Workflow events (shown in Figure 5-17).

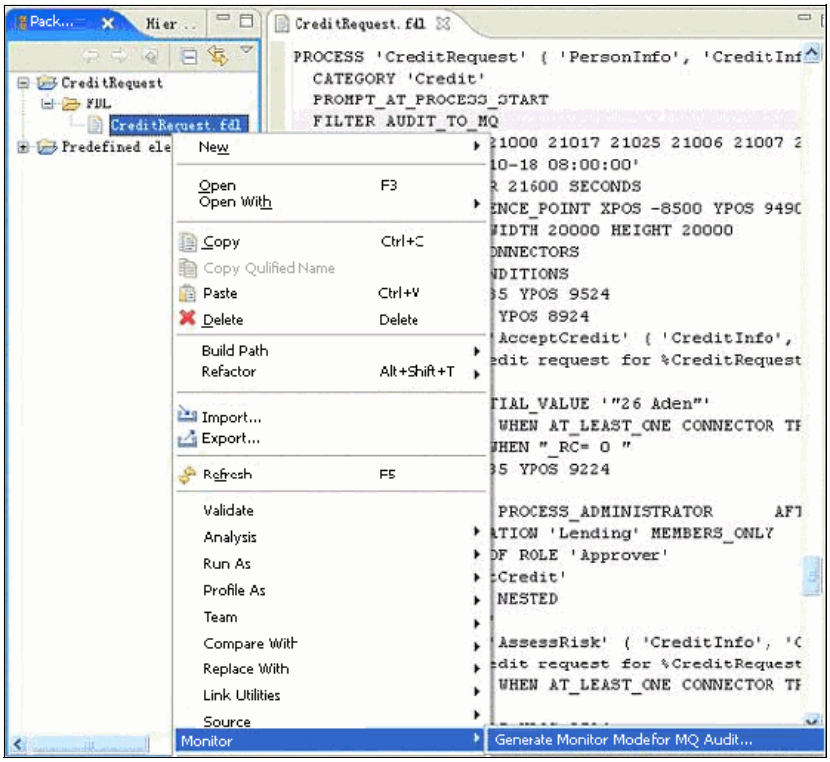

Figure 5-17 Generating the monitor model for a WebSphere MQ Workflow audit trail

With the Flow Definition Language (FDL) to monitor model utility, part of the WebSphere Business Monitor development toolkit, developers can import an existing FDL file so that they can generate event definitions and a monitor model. As well, WebSphere MQ Workflow provides a support pack that helps the runtime environment perform the following tasks:

- Emit the container data from the audit trail.
- Convert the audit trail data to Common Base Events using the WebSphere MQ Workflow Event Converter.
- Publish the Common Base Events to the Common Event Infrastructure (CEI).

In addition, WebSphere Business Monitor can receive events from WebSphere MQ applications when a WebSphere MQ link between the WebSphere MQ queue manager and the CEI that routes events to WebSphere Business Monitor is configured. WebSphere MQ applications can then send XML-based Common Base Events to the CEI server queue.

5.3.6 Monitoring business applications with WebSphere Adapters

To extend the reach of BAM, WebSphere Adapters lets you use events that come from various EISs and applications, including Oracle E-Business Suite, Siebel® Business Applications, mySAP™.com®, and JD Edwards® OneWorld (shown in Figure 5-18).

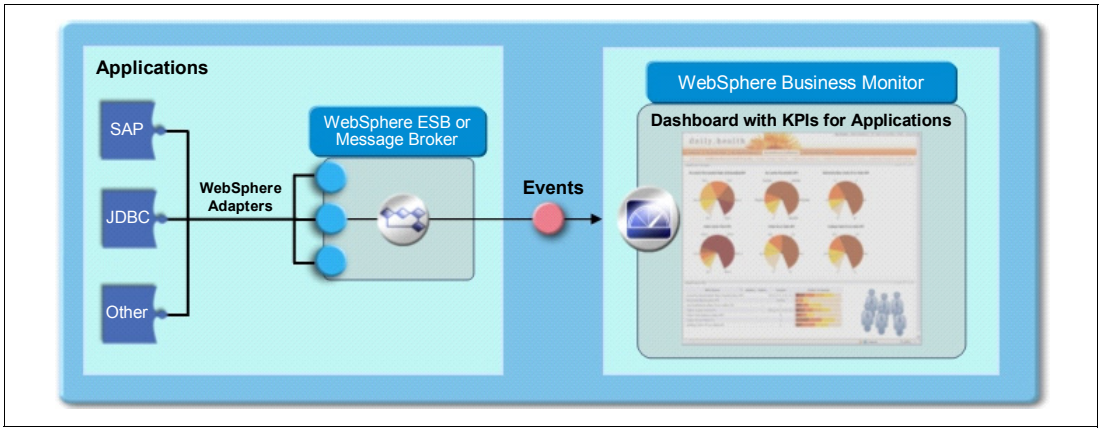

Figure 5-18 Leveraging events from various EISs and applications

To configure the use of adapter-based events with WebSphere Business Monitor:

1. Install the WebSphere adapter of your choice.
2. Create a mediation for the adapter using an enterprise service bus: WebSphere Enterprise Service Bus or WebSphere Message Broker.
3. Construct the mediation flow to send one or more events that contain relevant business information.
4. Construct the monitor model that defines how to consume the emitted events and defines the business measures to be calculated to facilitate business monitoring.
5. Deploy the mediation flow and monitor model application.

WebSphere Business Monitor includes SAP and Java Database Connectivity (JDBC) samples to illustrate how to use adapters to deliver events to WebSphere Business Monitor.

5.3.7 XSD-based events

WebSphere Business Monitor uses XML Schema Definition (XSD) to define events (shown in Figure 5-19), a standard for events among different distributed applications. This standard ensures that the data elements that comprise these events are consistent. Developers can define XSD-based user and system events in WebSphere Business Monitor so that business objects (such as invoices and purchase orders) can be expressed as XSDs.

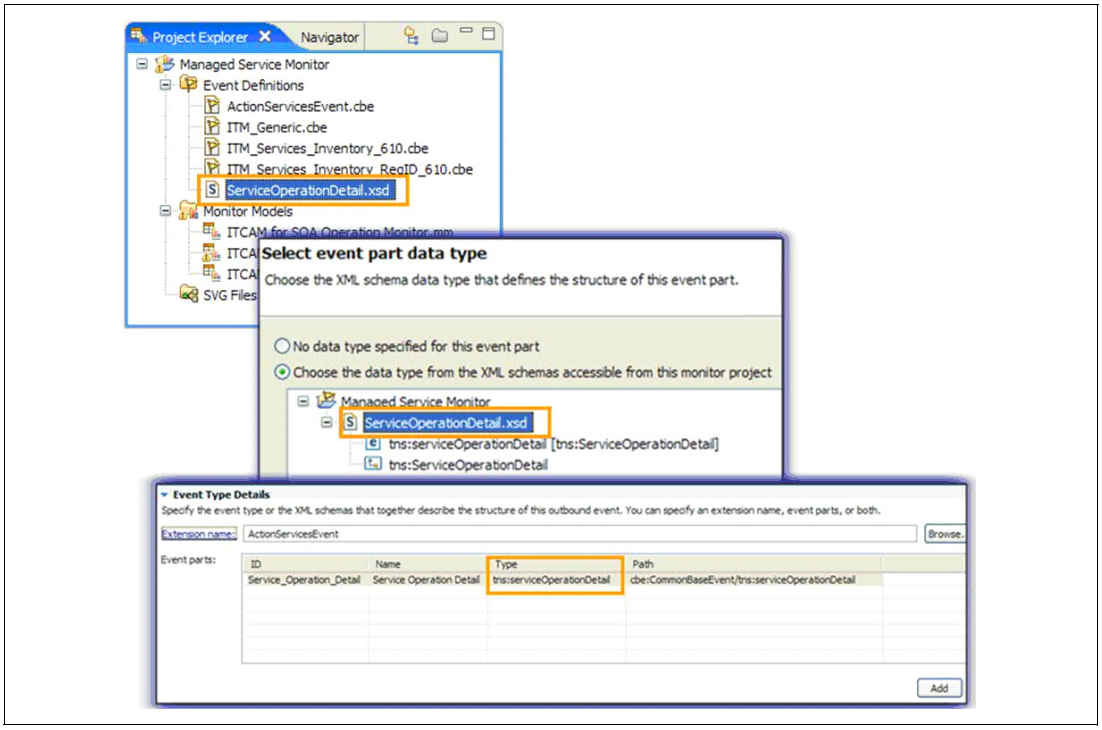

Figure 5-19 WebSphere Business Monitor showing XSD events

5.3.8 Robust event handling

Given the heterogeneity and size of many enterprise IT infrastructures, a business monitoring solution must provide high-quality service characteristics. The integrity of the monitoring solution needs to ensure that reported business results are based on complete, timely, and accurate events. For these reasons, WebSphere Business Monitor processes events quickly, manages failover, isolates bad events, and ensures that the monitoring solution receives events in the correct order.

When a tremendously large number of events need to be processed for monitoring and business metrics need to be updated frequently, administrators can use WebSphere Business Monitor to cluster event processing for scalability. They can deploy a monitor model (shown in Figure 5-20) on multiple WebSphere Business Monitor servers for workload balancing. If one server goes down or is unavailable, the high-availability manager ensures that no events are lost.

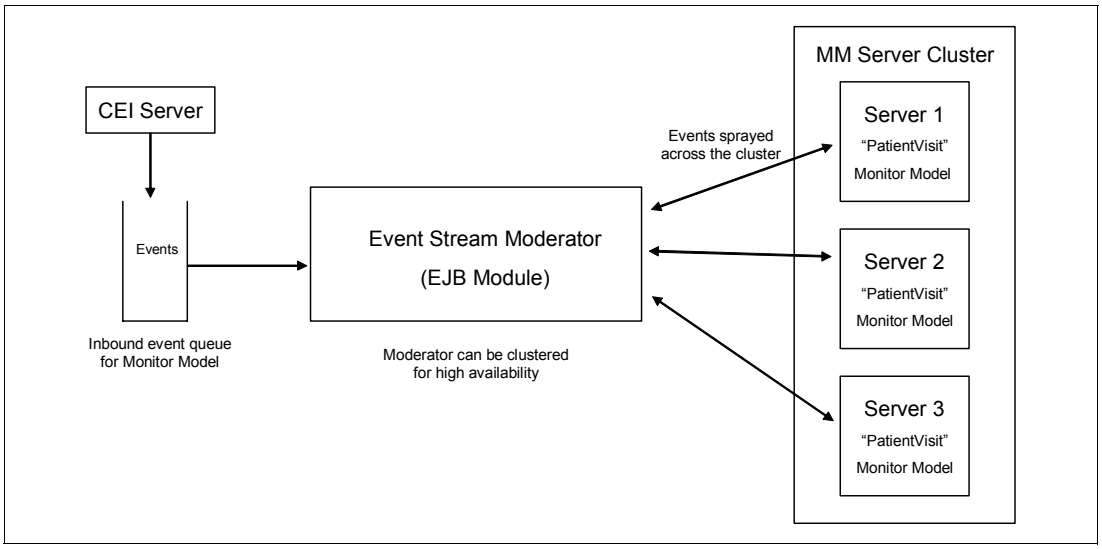

Figure 5-20 Cluster monitor model servers for workload management and high availability

The high-availability manager ensures that no events are lost

When a process emits events, it is often critical that those events be processed in the correct order. If they are not, incorrect business metrics are calculated. But events are not always received in the correct order when the events are emitted asynchronously. For example, an auditing monitor solution might identify internal requests that have not been approved on an order. If WebSphere Business Monitor receives an *On order* event before the *Approved* event, the monitor might raise a false alert in the dashboard or compile incorrect data for a report. However, using WebSphere Business Monitor, the solution can be configured to batch related events for processing, rather than processing them in the order in which they were received. When all of the related events are received, they are processed in the correct order, even if they arrived out of order.

5.3.9 Automating corrective and mitigating action

WebSphere Business Monitor provides a flexible and robust infrastructure for uncovering current and potential future business anomalies, or business situations, and automating responses to these situations.

The Action Services capability allows automated actions to be configured when the monitor solution triggers business situations, enabling your organization to implement increasingly effective responses to business situations that can arise as the insight into the business environment evolves. A common automated action is to send notifications. Additionally, a number of options exist for automated responses, including invoking Service Component Architecture (SCA) applications (for example, a BPEL process) and Web services.

5.4 Accelerating time to value

Developing robust BAM solutions involves two competing challenges: correlating data from a broad heterogeneous environment and being able to develop a rich monitor model for that environment quickly. The process of pulling in the correct data structures, having some examples or templates to start with, and testing iteratively can be complex and

time-consuming without the right tools. By using the WebSphere Business Monitor development toolkit, a developer can perform the following tasks:

- Work with business analysts by leveraging a monitoring specification that is defined in WebSphere Business Modeler as a starting point.
- Reuse existing generic and industry-specific assets.
- Easily monitor applications created in WebSphere Integration Developer.
- Easily test a monitor model without deploying to a production environment.

5.4.1 Simplified iterative development

Effective model development is often approached iteratively: develop, test, enhance, and test. WebSphere Business Monitor includes a full-function integrated test environment that developers can use to assess the progress in defining monitoring models. The Integrated Test Client (ITC) is a graphical interface that simplifies the emission of test events (shown in Figure 5-21), so developers do not have to instrument a live production system for testing purposes. The developer writes reusable test scripts that express both the events to be emitted and the order in which to emit them. The ITC provides the flexibility to define different combinations of test scripts to reflect various monitoring scenarios.

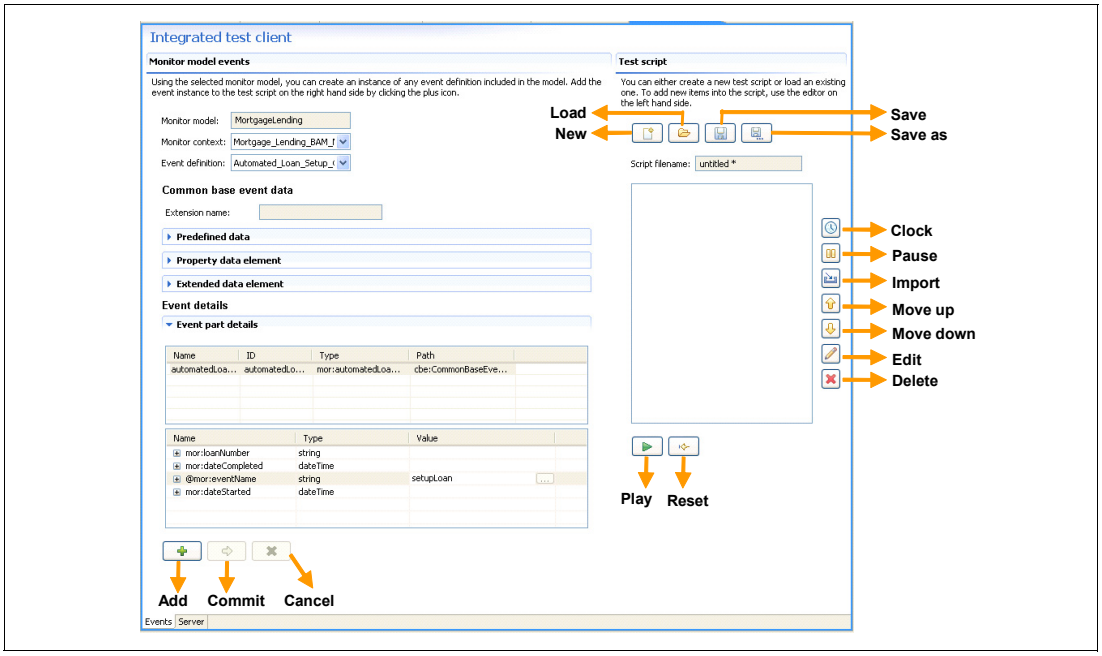

Figure 5-21 Test monitoring models by using the Integrated Test Client

With WebSphere Business Monitor, the steps required to deploy a monitor model application are streamlined so that developers can automatically create the database tables, deploy the generated EAR file to the monitor server, and start the monitoring solution simply by right-clicking the monitor model to generate the monitor model application and then adding the application to the test server, just like any other application. Developers can easily update the monitor model and redeploy for fast iterative development.

The WebSphere Business Monitor development toolkit also simplifies the testing of Scalable Vector Graphics (SVG) diagrams (shown in Figure 5-22) so that developers do not need to iteratively define the model, deploy it to the test server, emit test events, and finally observe the behavior of the SVG diagram. They can add actions to the shape sets directly, specify

test data, and generate and render a static diagram all in the development environment. No deployment or event emission is required.

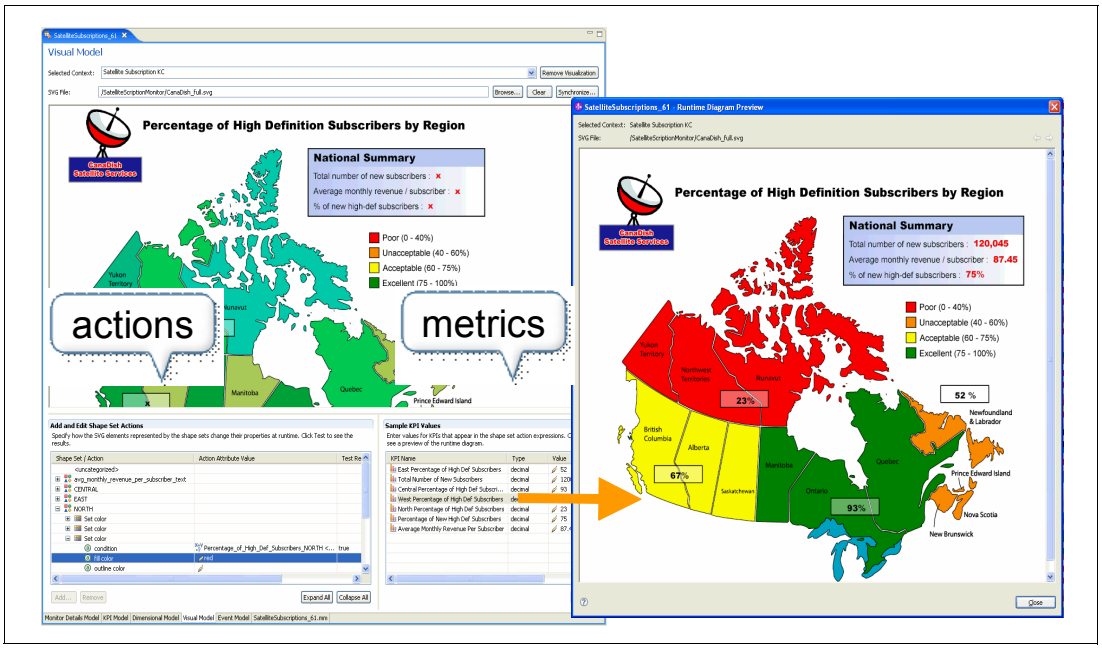

Figure 5-22 WebSphere Business Monitor shows SVG diagrams

5.4.2 Predefined templates and assets

WebSphere Business Monitor includes several predefined templates that support the generation of monitor constructs in models (shown in Figure 5-23) from several applications and components, actions metrics such as BPEL, enterprise service bus events, WebSphere MQ Workflow events, FileNet processes, SCA, and human tasks.

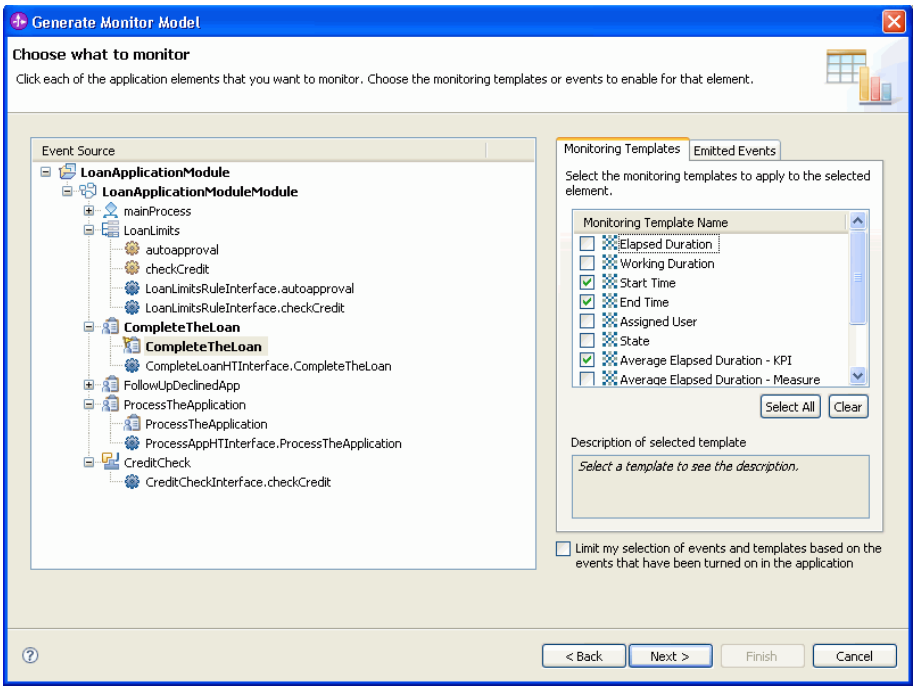

Figure 5-23 Defining monitoring models using predefined templates

5.4.3 SOA Business Catalog

The service-oriented architecture (SOA) Business Catalog is a comprehensive, online resource for ready-made business models (or predefined assets) supplied by IBM and IBM Business Partners that have been validated for enablement on IBM SOA products. The catalog (shown in Figure 5-24) holds thousands of assets, including adapters, Web services, process models, and plug-ins that are regularly updated to keep pace with business, technical, and regulatory changes and continually help you build your SOA solutions. Third parties (for example, IBM Business Partners) can register licensed assets in the catalog. The catalog provides an asset overview and details on where to get the asset and accompanying documentation. To access the SOA Business Catalog, go to Web site:

http://www.ibm.com/software/brandcatalog/portal/soa

You can search the catalog in many ways, including by using the following criteria:

- Asset type (code, data, model, or tools)
- Business need (for example, CRM, ER planning, business integration, or supply chain)
- Industry focus (over 20 industries to choose from)
- IBM SOA foundation product

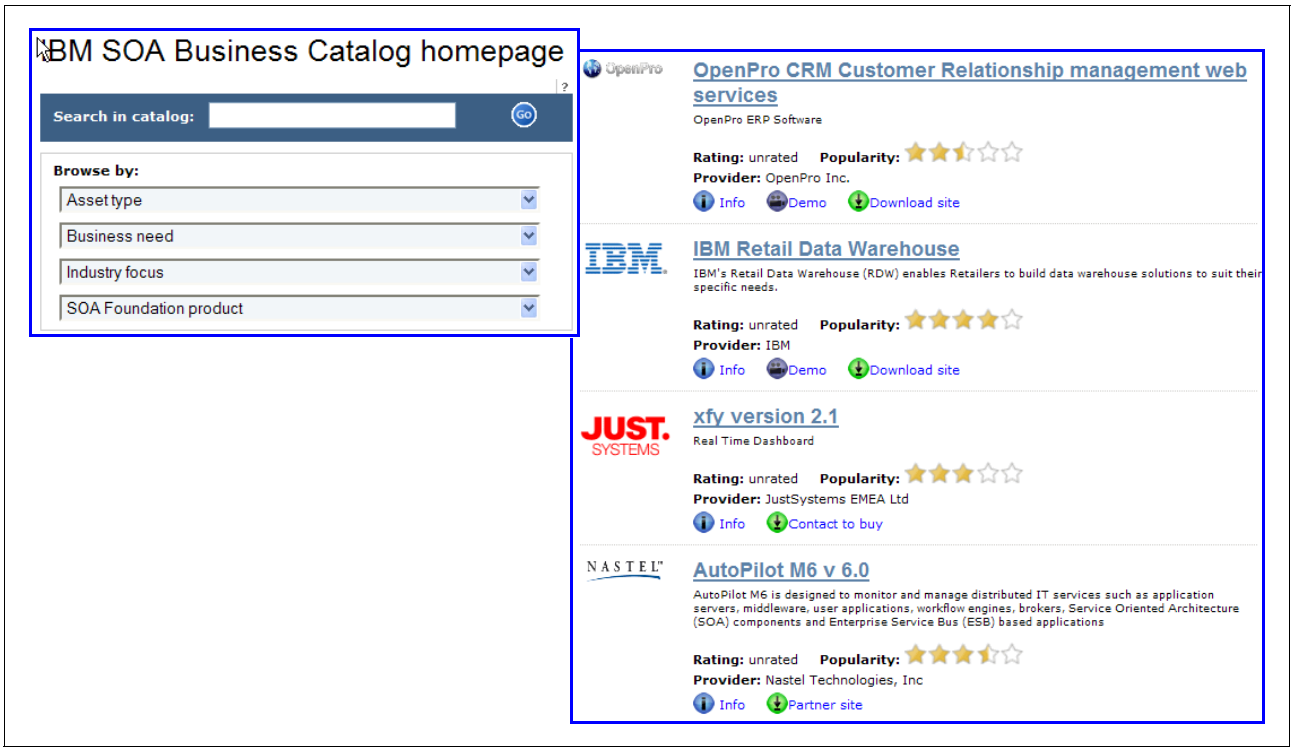

Figure 5-24 IBM SOA Business Catalog

IBM provides assets that are based on a long history of developing domain expertise. For example, assets that are associated with the Information Framework for Financial Markets draw on over 100 person years of modeling and analysis work with the financial services industry. Assets help you with such processes as post-trade processing and reporting, account opening, know-your-customer initiatives, and regulatory compliance, typically reducing analysis time by 40% and significantly accelerating the time it takes to secure stakeholder approvals.

5.4.4 Industry accelerators

Developers can leverage sample monitoring templates and dashboards, aligned with the WebSphere Business Services Fabric reference implementations, to accelerate the development of end-to-end BPM solutions.

These industry accelerators are provided for the banking, healthcare, insurance, and telecommunications industries. Figure 5-25 shows a business dashboard with the healthcare industry accelerator.

Figure 5-25 Business dashboard from the healthcare accelerator

5.4.5 KPI and Key Agility Indicator (KAI) libraries

KPIs are financial and nonfinancial measures that are generally expressed as cost, cycle times, and efficiency. They are specific quantifiable values that assess the performance or state of a business and the significant measurements used to track performance against business objectives. A KPI has a target, ranges, or both, to measure the improvement or deterioration in the performance of an activity that is critical to the business.

KPI and KAI libraries and benchmarks facilitate quick ROI

Standard key performance indicators are not enough to measure how agile companies are, so business users often look at areas such as human capital practices, financial management practices, and supply chain operations and target areas to increase agility and meet business challenges. What you are looking at are key agility indicators (KAIs), which are combinations of key performance indicators, business drivers, and leading practice statements that help evaluate how quickly and effectively a business can respond to changes, opportunities, and threats. As such, a KAI can also be a KPI, but not all KPIs indicate agility. KAIs determine a business' ability to become a globally integrated enterprise that can sense and respond to fluctuations in customer demand, detect and alert changes in real time, and

proactively monitor key business processes. The combination of new KAIs and traditional KPIs gives you complete information to support business decisions.

For example, Perfect Order Performance is a KPI and a KAI. It is a measurement of agility that reflects an organization's ability to sense and respond to the market fluctuations. This indicator can be applied across many industries.

WebSphere Business Modeler and WebSphere Business Monitor now have an embedded library of over 800 open-standard KPIs, including more than 300 KAIs based on the APQC Process Classification Framework (PCF). The KPI library enables KPI selection for various processes across several functions, including financial management, human capital management, customer relationship management, and supply chain management. Figure 5-26 shows how a developer selects standard KPIs using the KPI library in the WebSphere Business Monitor development toolkit.

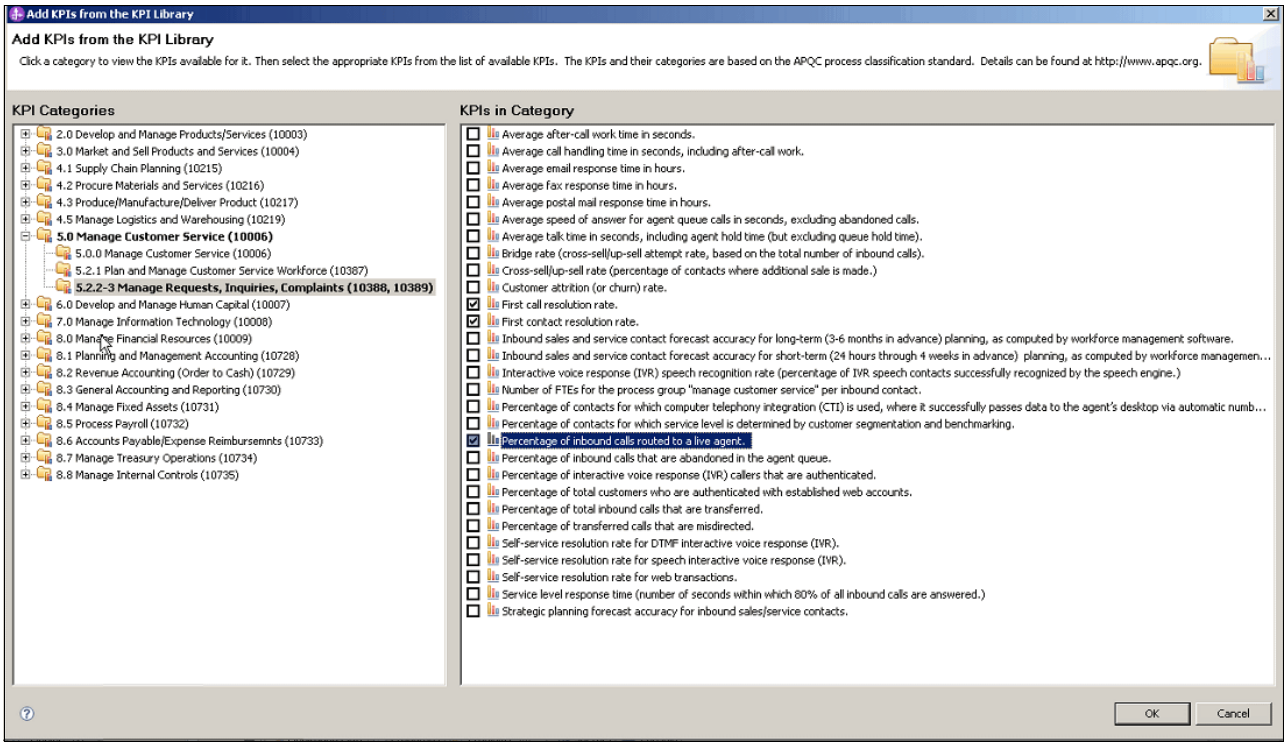

Figure 5-26 Selecting KPIs using the KPI library in WebSphere Business Monitor

By working with IBM or APQC, benchmark values for the KPIs and KAIs can be obtained to help define appropriate targets for the business. With the KPI library, business analysts can quickly and easily discover and use KPIs to speed time to value when modeling business processes and monitoring business activity.

5.4.6 Synchronization with WebSphere Integration Developer

To quickly use SCA modules from WebSphere Integration Developer and define monitor models, WebSphere Business Monitor provides the Generate Monitor Model wizard (shown in Figure 5-27), which introspects an SCA module to generate a stand-alone monitor model that is based on a predefined template for that type of SCA module (BPEL process, human task, mediation, and so on). The generated model can then be modified.

Developers might generate the first monitor model from an application as a starting point. Additional monitoring elements can be added as the solution grows. Or perhaps there was an oversight to include some monitoring elements in the originally generated model, or there are ongoing changes made to a model by a team of developers. In any case, developers maintain the flexibility to add other monitoring elements iteratively, which allows both the application and the corresponding monitoring solution to co-evolve. By using the integrated tools, developers can keep the two code bases (runtime code and monitor model code) in sync, without having to manually reconcile existing and updated monitor models.

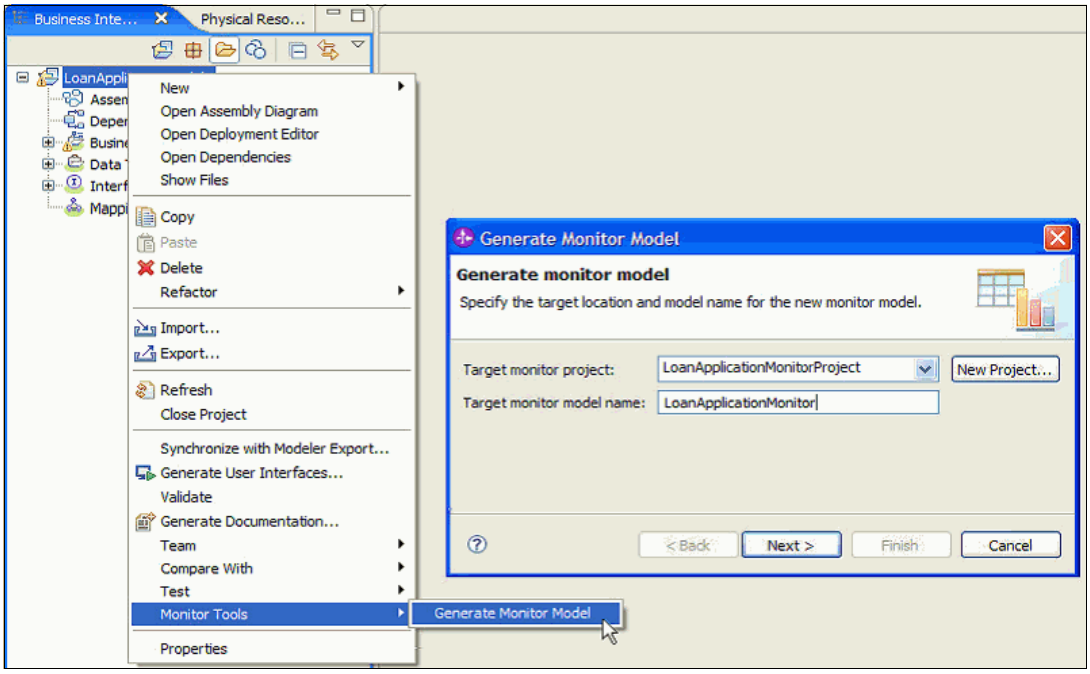

Figure 5-27 Generating a monitor model from WebSphere Integration Developer

Changes to the names of WebSphere Integration Developer artifacts (for example, modules, components, interfaces, namespaces, and business objects) are applied to the monitor model through live refactoring. Other changes can be reconciled using synchronization facilities (shown in Figure 5-28) to add or remove event sources, interface operation parameters, and so on.

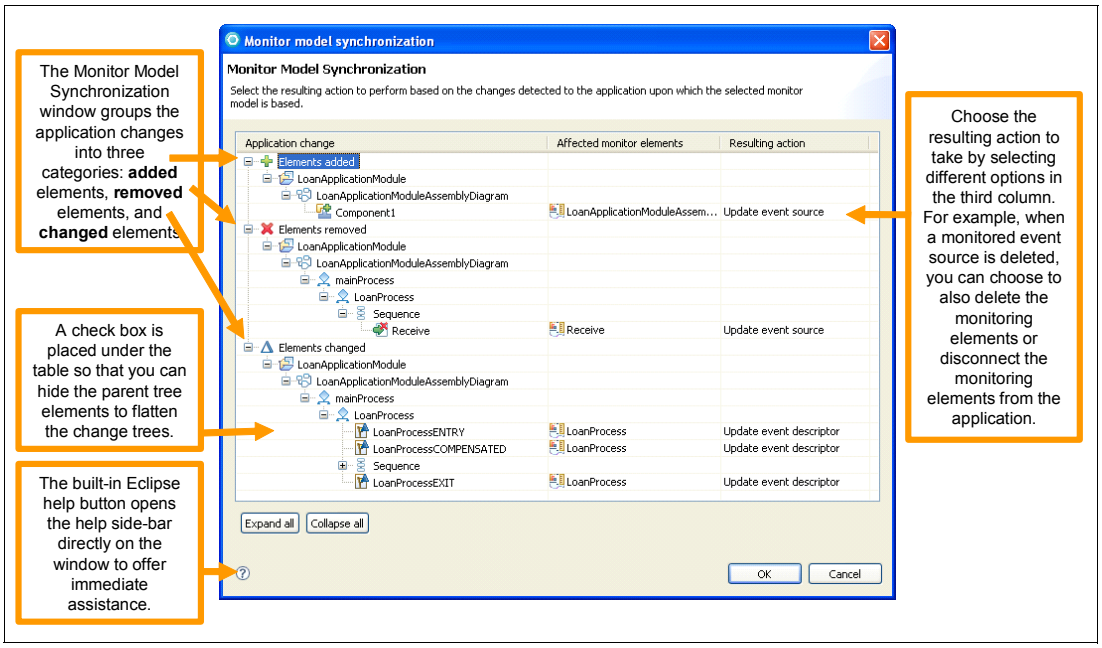

Figure 5-28 Synchronizing changes between WebSphere Integration Developer and WebSphere Business Monitor

5.4.7 Synchronization with WebSphere Business Modeler

Different users can provide input to a monitor model definition. The business analyst can use the Business Measures view (shown in Figure 5-29) of WebSphere Business Modeler to define the broad characteristics of KPIs and other business metrics. Then the WebSphere Business Monitor developer can import these definitions into the WebSphere Business Monitor development toolkit as a starting point to more advanced monitor model development.

In addition, business analysts can easily define business measures and test processes directly on a test server using business measures from WebSphere Business Modeler, without the need to export to the development tool. Thus, business analysts can define a business process and associated measures, test the process execution and business measure calculations, visualize the business measures, iteratively make adjustments, and add additional business measures and retest, all without involving IT, which greatly simplifies solution development and reduces the time to value.

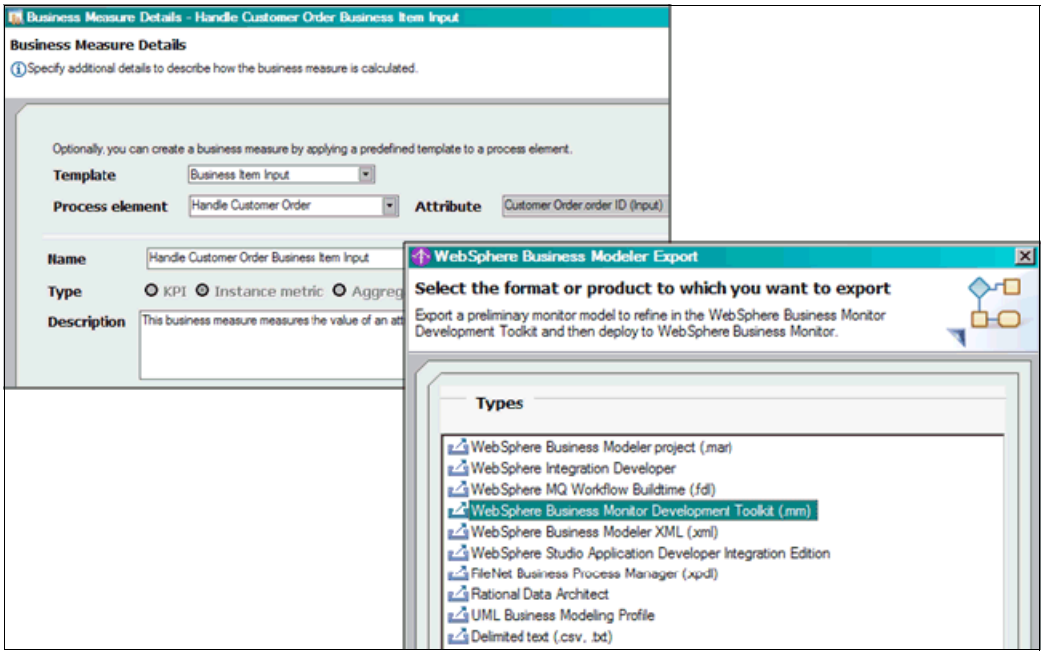

Figure 5-29 Business Measures view in WebSphere Business Modeler

With WebSphere Business Monitor, developers can iteratively review updates coming from WebSphere Business Modeler, compare how changes affect the currently implemented monitor model, and easily synchronize selected changes.

5.4.8 Developing using Rational Application Developer

What needs to be monitored determines which tool platform to use. With WebSphere Business Monitor, your organization can choose from two tool platform choices:

- Install the WebSphere Business Monitor development toolkit on top of WebSphere Integration Developer and maintain first-class integration to monitor BPEL-based solutions, SCA, or other components, and use patterns-based monitor model generation, refactoring, and synchronization.
- For BAM solutions that do not require the ability to monitor components running on WebSphere Process Server, install WebSphere Business Monitor in Rational Application Developer and benefit from the smaller footprint of Rational Application Developer.

5.4.9 Full-function unit test environment with interactive debug

WebSphere Business Monitor enables the rapid development of monitoring solutions. A full-function development test environment, including a comprehensive graphical debugger, enables the complete testing of monitoring solutions before deployment to a full-fledged production environment.

5.4.10 Event recording and playback

Administrators and developers can configure the business monitoring solution to store incoming events that can be replayed later, which developers can use, for example, to iteratively test a monitor solution. Now administrators and developers can save a set of test

events, update a monitor model, redeploy the monitor model, and replay the saved events to evaluate the changes made to the monitor model (Figure 5-30).

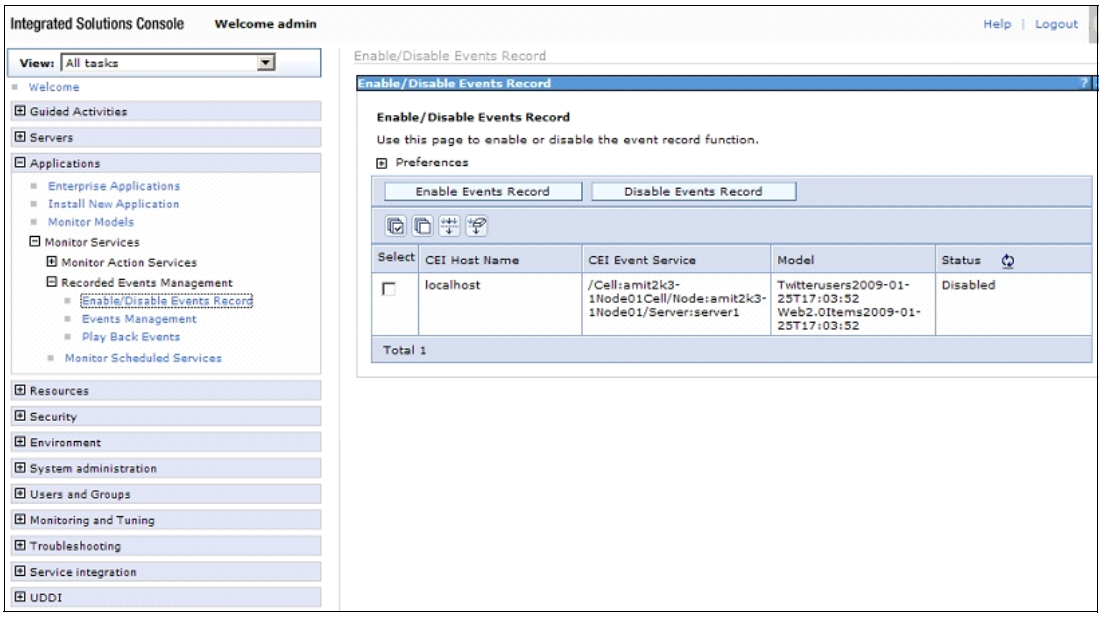

Figure 5-30 Administering event recording and playback in WebSphere Business Monitor

5.5 Lowering the total cost of ownership

The time and effort required to install and administer a monitoring solution must be minimal. To speed the installation and administration steps, WebSphere Business Monitor provides flexible options that administrators can use to customize the configuration of the IT environment and easy-to-use administrative capabilities to ensure that monitoring data is properly replicated and security is effectively enabled.

5.5.1 Flexible configurations

Not all business monitoring requirements are the same. Some people want a robust portal infrastructure that will serve as the framework for business monitoring. Some people might need to enable dimensional analysis to generate multidimensional reports and analyze different dimensions of data. Still others look for a lightweight infrastructure to get started. WebSphere Business Monitor now provides a Web-based dashboard that uses REST services for data access, JavaScript Object Notation (JSON) for data exchange, and the Dojo open-source AJAX toolkit for dashboard rendering. This Web-based dashboard configuration requires WebSphere Application Server only.

To flexibly accommodate various configuration needs, WebSphere Business Monitor supports four configurations:

- A business space Web-based dashboard, which is a lightweight configuration
- A business space Web-based dashboard plus dimensional analysis, which includes DB2 Alphablox, enabling a light configuration for both real-time and historic trend analysis
- WebSphere Portal-based dashboard, which is a dashboard configuration rendered in WebSphere Portal Server to offer integration in a broader collaboration environment

- WebSphere Portal-based dashboard plus dimensional analysis, which is a portal-based dashboard with DB2 Alphablox, providing complete monitoring capabilities in the WebSphere Portal collaboration environment

These configurations are complementary. Therefore, a monitoring solution can be initially deployed on a Web-based dashboard and then subsequently modified for deployment on a portal framework. Figure 5-31 shows the end-to-end monitoring life-cycle steps for the Web-based dashboard configuration.

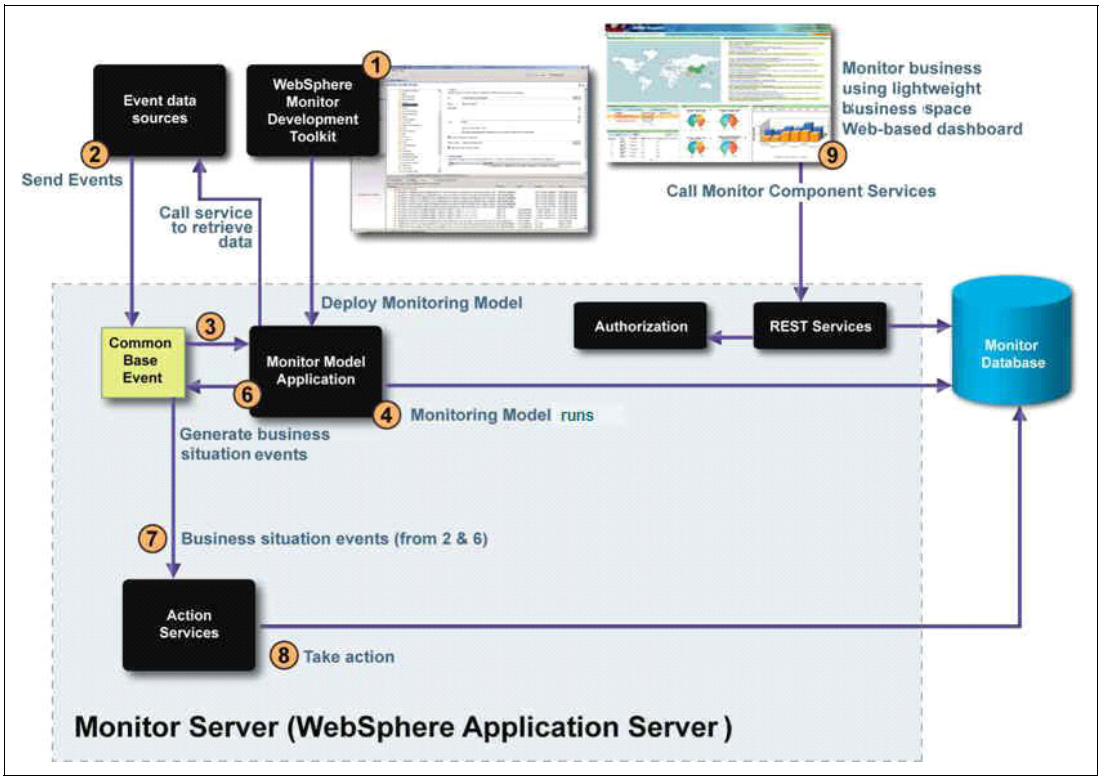

Figure 5-31 End-to-end monitoring life-cycle steps for Web-based dashboard configuration

The numbers in Figure 5-31 correspond to the following actions:

1. The business analyst defines and deploys the monitor model using WebSphere Business Monitor development toolkit (which is installed on Rational Application Developer or WebSphere Integration Developer).
2. Event sources emit events that contain business-relevant data.
3. Inbound event data is received through the Common Event Infrastructure (CEI).
4. Event data is correlated through the deployed monitor model.
5. Additional data is retrieved from data sources using user-defined functions.
6. Business situation events are filtered, and relevant events are returned to the CEI.
7. Action services process the business situation events.
8. Outbound actions and events are handled and written to the WebSphere Business Monitor database.
9. Business metrics are displayed in a business space.

5.5.2 Simplifying administration

WebSphere Business Monitor simplifies the administration of monitor models, security, and user registries.

For deployment on a production server, WebSphere Business Monitor enables flexible control regarding monitor models (shown in Figure 5-32). There are specific pages for monitor model deployments that streamline running the schema and DMS scripts and setting up cube and CEI configuration information.

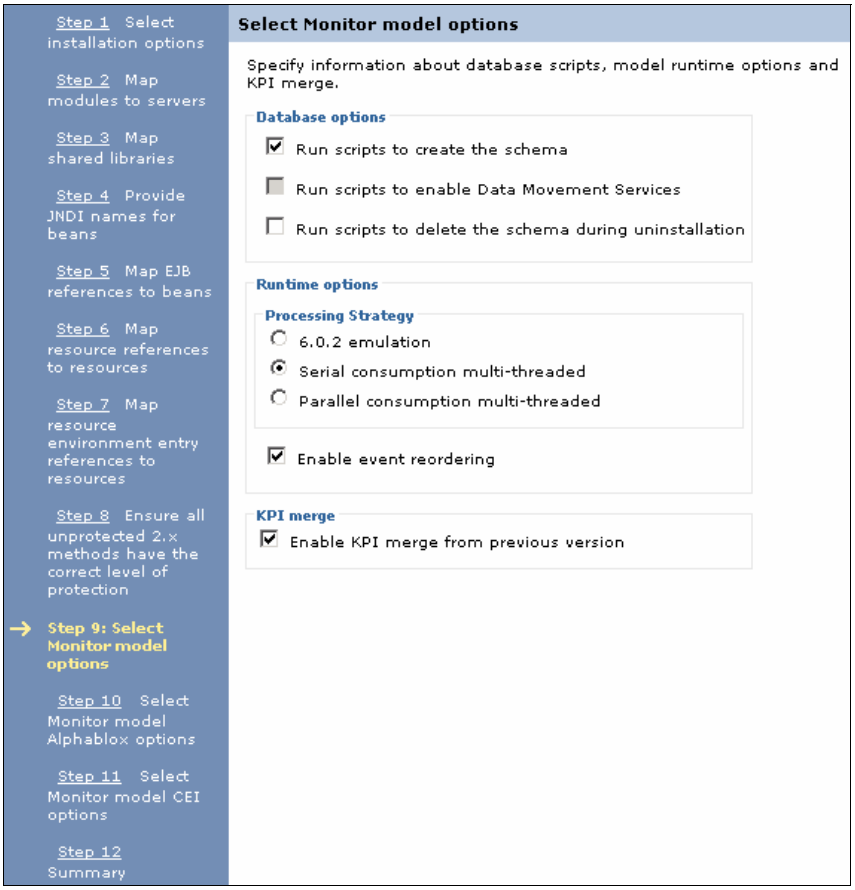

Figure 5-32 Selecting monitor model options of deployment time

5.6 Summary

With WebSphere Business Monitor, business users can assess and manage business activity. The range of activity that can be monitored varies widely: from activity on human or automated tasks to activity on process-oriented or data-driven solutions to obtain operational or strategic insight. Business users can determine the kind of dashboard to use (Web-based or portal-based) and the relevant data that you want shown on the dashboard, all in a scalable and secure environment.

6

Enabling dynamic BPM with WebSphere Business Services Fabric

This chapter discusses enabling business agility with WebSphere Business Services Fabric. WebSphere Business Services Fabric helps you perform the following tasks:

- Rapidly change business service policies without requiring redeployment
- Accelerate solution development with Industry Content Pack assets
- Reuse business services and vocabularies from an asset repository
- Simulate solution behavior to assess business service policies before deployment
- Manage and govern the life cycle of composite business applications

6.1 Introduction

Being able to adapt rapidly and flexibly can set your company apart from the rest

Every business, regardless of its size or the industry to which it belongs, faces the challenge of knowing how to change complex processes rapidly and respond quickly to new demands for process variations. Organizations need to be able to create new innovative business models, deliver new and exciting products and services, and customize their products and services to varying customer segments. Adding new geographies, channels, partners, suppliers, and products are examples of how processes are rapidly becoming complex in the marketplace. Adding to that complexity are infrastructure changes resulting from system consolidations to mergers and acquisitions or existing system modernization. Wherever the need originates, being able to adapt to these changes rapidly and flexibly can set your company apart from the rest. The faster a company can incorporate change, the more agile it is, and the more competitive it can be in the marketplace.

Business process management (BPM) enabled by service-oriented architecture (SOA) helps you manage and control continuous change. However, the marketplace requires companies to change dynamically and innovate faster than ever before. WebSphere Business Services Fabric builds on the SOA foundation by enabling you to combine reusable building blocks, called *business services*, into composite business applications (CBAs) in a service-oriented environment. WebSphere Business Services Fabric can help your business achieve dynamic process change more rapidly and manage that change more easily over time.

6.2 A foundation for composite business applications

WebSphere Business Services Fabric is a comprehensive SOA offering that delivers dynamic BPM capabilities to model, assemble, manage, deploy, and govern composite business applications. With WebSphere Business Services Fabric, organizations can compose business-level services into extended, cross-enterprise business processes and solutions, solutions that are dynamically assembled based on the business context in which they run.

While organizations adopt SOA as a way to improve business agility, drive innovation, and make the most of their IT investments, WebSphere Business Services Fabric-developed composite business applications can help them gain improved flexibility by leveraging distributed, loosely coupled business-level services that are exposed from existing systems, packaged applications, outsourced service providers, custom applications, and other third-party IT assets.

Note: This section's discussion of the WebSphere Business Services Fabric core concepts and technologies (business services, composite business applications, dynamic assembly, and the Business Service Repository) was derived from the IBM Redbooks publication *Getting Started with IBM WebSphere Business Services Fabric V6.1*, SG24-7614. To view or download this book, go to the IBM Redbooks Web site:

`http://www.redbooks.ibm.com/abstracts/sg247614.html?Open`

6.2.1 Business services

The building blocks of composite business applications are business services. Business services may also be considered coarse-grained Web services. They represent business functions, transactions, or processes that are available over an internal or external network. A business service is an abstract representation of a business function, hiding the specifics of the function interfaces. It provides a separation of concern between the business function and the implementation supporting it. The ability to attach metadata to business services and processes differentiates WebSphere Business Services Fabric from other tools and infrastructure and provides a powerful and expressive way to maintain flexibility in service composition.

A business service is not a technical service; it does not define operations, port types, or binding information as a technical Web service does. In contrast, a business service addresses the remaining information that is necessary to place the service in context and apply it correctly, such as service availability, user entitlements, lines of business supported, and the relationship that one business service has to other services.

A business service bridges the understanding between business and IT, making it possible for business and IT users to perform the following tasks:

- Establish a consistent model for services so that they can be correctly understood.
- Capture business constraints around service delivery.
- Map core business functions to supporting IT capabilities.
- Simplify the design, implementation, and maintenance of business processes.
- Govern the assembly of services into composite business applications.

Business services can be described as the intersection of three characteristics:

- Who uses them
- How they are made available
- What functionality and capability they provide

A business service is the encapsulation of these characteristics as illustrated in Figure 6-1.

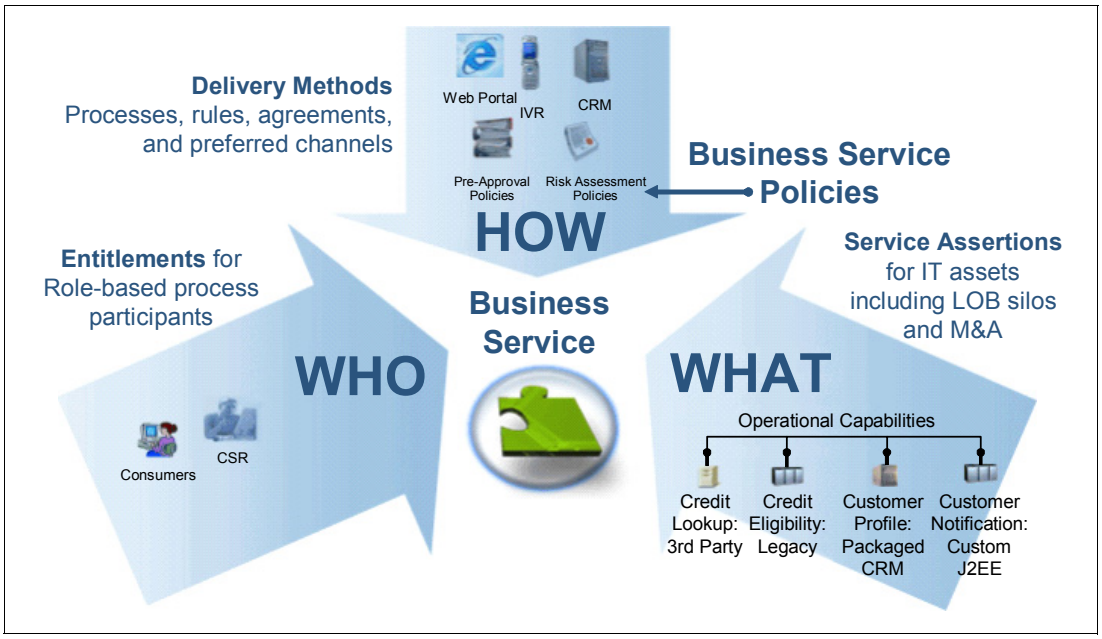

Figure 6-1 A business service describe the who, what, and how of a business function

6.2.2 Composite business applications

A *composite business application* (CBA) is a collection of related and integrated business services that provide a specific business solution and support multiple business processes built on SOA. At first glance, a CBA might look like a collection of business services. However, a CBA is a broader, more comprehensive view of the business solution that leverages the business services to deliver the ultimate solution, driving the process, channels, roles, and business object model of the overall business solution.

A CBA shares many of the characteristics that are associated with business services:

- Delivers a specific business outcome, because it is designed at the business level
- Uses business service policies and metadata to describe and explain service and solution characteristics, such as costs, availability, supported roles, supported channels, standards, and operational capabilities
- Leverages industry models to support interoperability and common understanding
- Supports multiple consumption channels, such as Web and B2B

Unlike business services, a CBA is pulled together at run time; it is dynamic and is also more specialized, particularly when noting the solution data model, channels supported, and roles and organizations to which it has been entitled. The following attributes and characteristics are associated with a CBA:

- Consumer channels
- Business processes
- Business service policies
- Business object model and data model
- Metadata model and extensions
- A more course-grained business solution process model

A CBA also lets you consolidate information, creating distinct opportunities for discovery and change over the life cycle of the application. As noted with business services, a CBA also represents the dynamics and understanding that will be enacted when the application is called upon.

6.2.3 Dynamic assembly

By developing and delivering CBAs and business services with WebSphere Business Services Fabric, you can realize flexible and agile solutions, creating solutions that can be built and managed at the pace of business, because services are dynamically assembled while CBAs and business services run.

CBAs and business services require expressive metadata that provides a comprehensive description of the artifacts. Additionally, business service policies or business knowledge can be represented as metadata, which creates an understanding of the business service and CBA that is meaningful and insightful regarding both business expectations and technical considerations. This information is leveraged at run time to influence how CBAs and business services run, ultimately allowing solutions to be composed in declarative terms and delivered at run time.

Moreover, for dynamic assembly, you are not required to create programming logic by writing procedural code. Instead, you leverage the declarative knowledge of the metadata and a runtime capability that can digest the metadata and the current known circumstances of the moment, such as the business context. When the metadata and business context are

processed, the guidance is provided to the CBA and business service, thereby customizing the current instantiation.

When much of the guidance is based on metadata and business context, the guidance used for the CBA and associated business services changes if the metadata changes. This powerful concept is the key to realizing flexibility and agility. In WebSphere Business Services Fabric, the guidance provided to the business service at run time is the intersection of three concepts:

- The operating context of the CBA or business service, such as which role is instantiating the request, over which channel, at what time of day or day of year
- Information in the request payload that might be relevant to the metadata authored in policies or attached to services. For example, if the Loan Application CBA were invoked, it would be important to know if the request was for a home loan or an automobile loan. The content of the invocation messages typically contains this data.
- The capabilities, restrictions, and preferences for a CBA or business service. This contract is defined at run time and is a combination of the metadata and business service policies that are relevant for the particular circumstances.

The series of events that occur at run time are pictured in Figure 6-2.

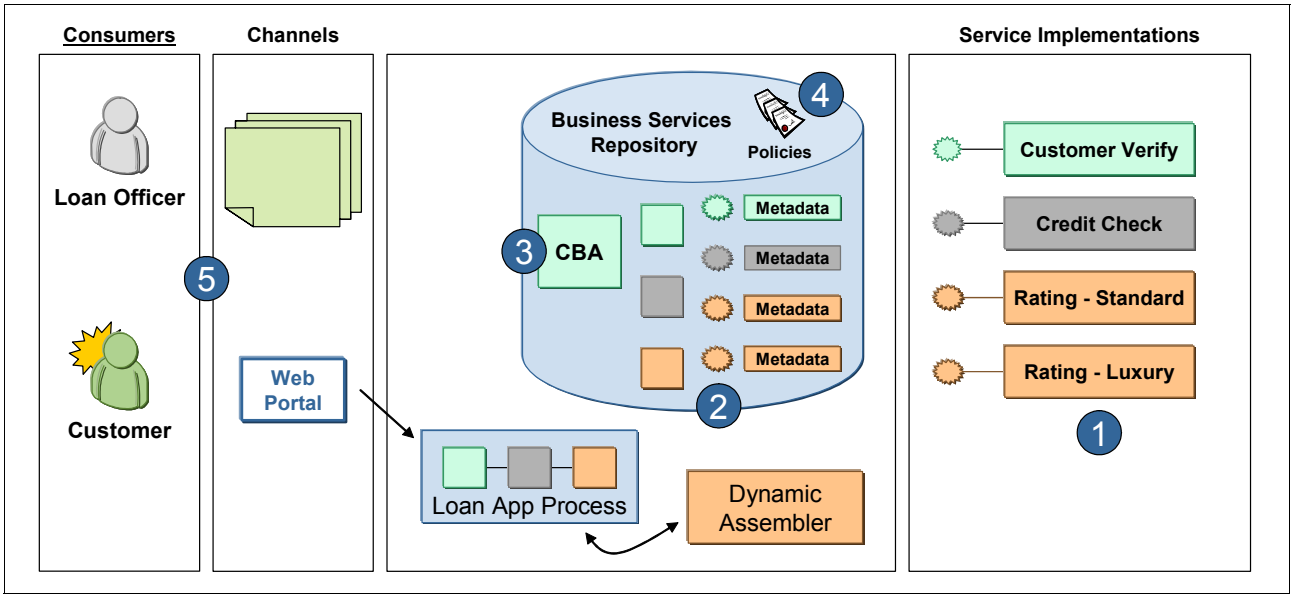

Figure 6-2 The series of events that occur at run time

The numbers in Figure 6-2 and in Figure 6-3 on page 116 correspond to the following actions:

1. The endpoint implementations are defined. For example, one endpoint is for a Luxury Home Loan rating and the other is for a Standard Home Loan rating. These endpoints are existing capabilities that have been service-enabled. The technical specification for the service implementations is available from a service registry, such as WebSphere Service Registry and Repository.
2. A Loan Rating business service is created, and metadata describing the business service is published to a metadata repository. The business service is associated with both the Luxury Home Loan rating and the Standard Home Loan rating service implementations.
3. The Loan Process CBA is created and metadata describing the service is published into a metadata repository. The Loan Process CBA creates the Loan Rating business service

and other services, such as the Customer Verification service and the Customer Credit Check service (not shown in Figure 6-2).

4. A business service policy has been created and published to the metadata repository. The business service policy states “all home loan applications that are greater than or equal to 500,000 are considered luxury homes and all home loan applications under 500,000 are considered standard homes.”
5. A home loan may be requested by a Bank Loan officer or a customer directly. Two channels exist: a browser interface for the customer-direct loans and a branch office batch interface for Bank Loan officer-initiated loans.

Figure 6-3 shows the series of events that occur at run time.

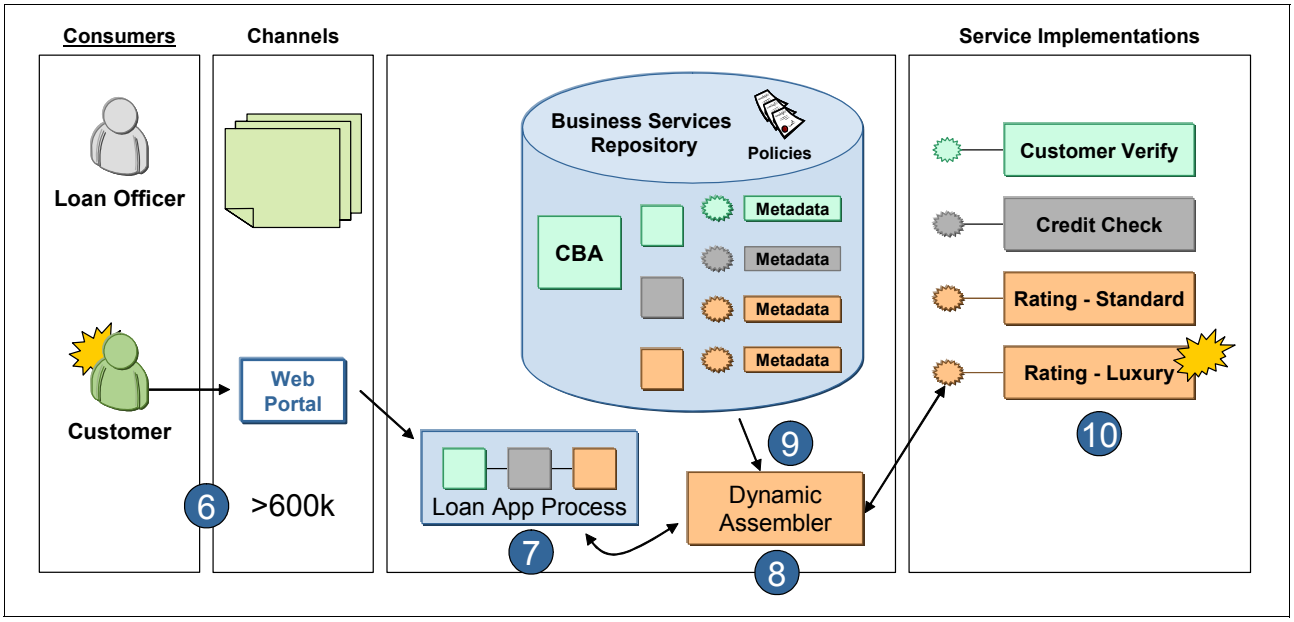

Figure 6-3 The series of events that occur at run time

6. The loan application has been directly requested by the customer and the home loan application is for 600,000.
7. The Loan Process CBA is instantiated with the loan application. Customer Verification and Credit Steps are completed, bringing the application to the Loan Rating service.
8. The Loan Rating service has two possible process variations: Luxury Home Rating or Standard Home Rating. The Loan Rating service defers the decision regarding the process variation to the runtime engine, the Dynamic Assembler.
9. The Dynamic Assembler reviews the context of this request (Customer-Direct over Bank Loan Officer channel), the content of this call (Loan Application greater than 500,000), and all metadata and policies to assemble the contract or select the business service policy. One business service policy is applicable; it says that all loan applications greater than 500,000 are considered Luxury Home Loans.
10. The Dynamic Assembler realizes that two process variations exist for the Loan Rating service; however, only one variation meets the business service policy criteria of rating a luxury home. The dynamic assembler selects the Luxury Home variation of the Loan Rating service, completing the loan application process.

This example illustrates the actions taken in WebSphere Business Services Fabric to dynamically assemble business services. However, WebSphere Business Services Fabric also ensures flexibility and agility when additional business requirements come into play, such as if this application process required that all loans over 900,000 be underwritten by a third party, using their XtraBigLoans rating engine.

Because this Loan Processing solution uses business services and composite business application concepts implemented by WebSphere Business Services Fabric, only two additions to the CBA are required to meet this new requirement:

1. A new Loan Rating process variation that supports XtraBigLoans.
2. A new business service policy stating that all loans greater than or equal to 900,000 are XtraBigLoans.

Figure 6-4 shows that all loan applications greater than 900,000 will be rated using the XtraBigLoan rating process variation.

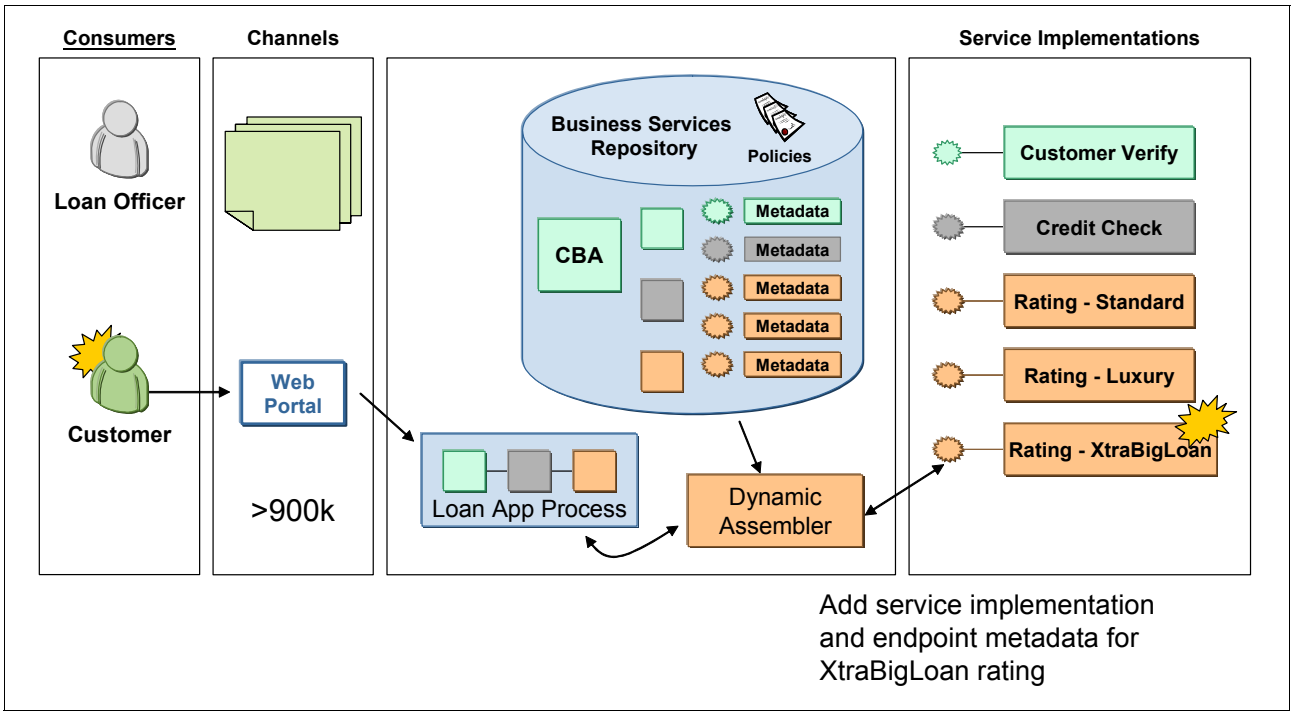

Figure 6-4 New business service policies can easily be added to accommodate changes

With just a few simple additions, our Loan Process was able to adapt and react to new business requirements, effectively managing the process at the pace of business.

6.2.4 Business Service Repository

Core to WebSphere Business Services Fabric is a comprehensive Business Service Repository (BSR), which is a place to model, store, and manage the metadata, business service policies, and entitlements necessary to describe and use business services. The BSR is more than just a container of information. It provides the means by which information is organized and arranged, not only for retrieval but also to clarify understanding through the organization of metadata and relationships between business services, business service policies, and subscriptions.

The BSR provides the basis for the governance and life-cycle management of information with regard to creation, ownership, modification, and classification. It also incorporates ontologies to model the business services knowledge domain. An *ontology* describes the vocabulary, structure, constraints, relationships, and behaviors of business services, providing a rich and comprehensive representation and understanding.

Ontologies enable the applications that refer to them to be standardized while allowing the information that they contain to be changed. The WebSphere Business Services Fabric ontology can be extended using WebSphere Business Services Fabric authoring widgets available in business spaces. Additionally, ontologies can be modeled with Resources Definition Framework (RDF) and Web Ontology Language (OWL), which are W3C standards, making them extensible and allowing them to adapt to future requirements.

Base BSR models can be extended using WebSphere Business Services Fabric Industry Content Packs. Industry Content Packs provide industry-specific extensions to the models, accelerating solution development. The BSR model is persisted to a relational database management system, enabling enterprise-level manageability.

6.3 Accelerating time to value

Get started defining your business service policies faster

Industry Content Packs contain predefined SOA assets that help you get started defining your business service policies faster. The following Industry Content Packs include business service templates that are based on industry standards and practices.

Each of the following Industry Content Packs includes revisions to business service metadata, additions to channels, roles, and assertions based on new standards, capability and process maps, plus the following industry-specific features:

- IBM Insurance Property & Casualty Content, which focuses on the property and casualty lines of business for insurance enterprises, includes support for standards, such as eEG7 SMILe Data Dictionary (extended from Core Components) and eEG7-based data model, and additional common services based on ACORD business object models and ACORD PC 1.10 standards.
- IBM Healthcare Payor Content Pack, which focuses on the of health insurance processes, includes support for standards, such as HL7 Vocabulary, additional interfaces, and additional common services based on ASC-X12, HL7 2.x, and HL7 3.0 standards.
- IBM Banking Payments Content Pack, which focuses on the payment capabilities of financial services enterprises, includes support for standards, such as ISO20022 Data Dictionary, ISO20022 Data Dictionary-based business object models, and SEPA 2.2, process maps based on ISO20022 standards, and additional common services based on SEPA, SEPA-AOS, and NACHA standards.
- IBM Telecom Operations Content Pack, which focuses on the service provisioning and service assurance processes for telecommunication service providers, includes process and capability maps based on eTOM, updated XML Schema Definitions (XSDs), additional interface definitions, and additional common services.
- IBM Product Lifecycle Management (PLM), which focuses on the integration of systems, processes, and data across the complete product life cycle and applies to the automotive, electronics, aerospace, and defense industries. The PLM content pack includes pre-built assets that are derived from the following industry standards: American Productivity & Quality Center Process Classification Framework (APQC PCF) models, Object Management Group Product Life-cycle Management (OMG PLM) Services 2.0, Verband

der Automobilindustrie e. V (VDA) 4965, and Open Applications Group Integration Specification (OAGIS) 9.1 Models.

Figure 6-5 shows assertions included in the IBM Insurance Property & Casualty Content Pack.

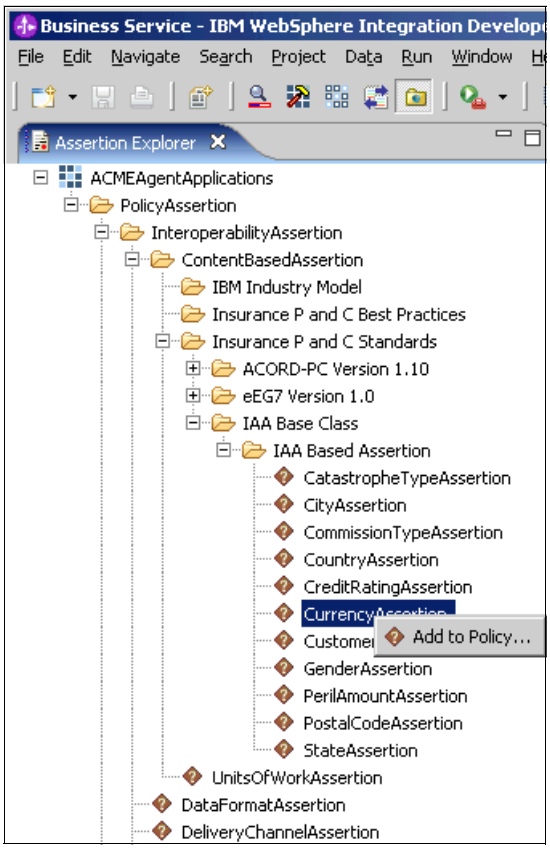

Figure 6-5 Assertions included in the IBM Insurance Property & Casualty Content Pack

6.3.1 Knowledge assets

The *Reference Architecture Guide*, *How-To Guide*, and *Developer's Guide* in each Industry Content Pack provide detailed industry-specific documentation:

- *Reference Architecture Guide* explains the high-level architecture for content packs, how Industry Content Pack architecture fits in with IBM SOA reference architecture, and how Industry Content Pack assets fit in with various IBM tools and products across different phases of SOA life-cycle methodology.
- *How-To Guide* explains the usage and extension patterns for Industry Content Pack assets with respect to an SOA solution using a case study.
- *Developer's Guide* now addresses usage and extension scenarios for each Industry Content Pack and includes valuable feedback from clients.

6.3.2 Capability and process maps by industry

Industry Capability and Process Maps, which are based on industry standards such as eTOM, TAM, ISO 20022, ACORD, and HL7, help you attain business-to-IT alignment by giving you top-down visibility into the business by identifying the business capabilities and

processes that are consistently reusable by mapping capabilities, processes, and business services. Figure 6-6 exemplifies a banking payment capability and process map.

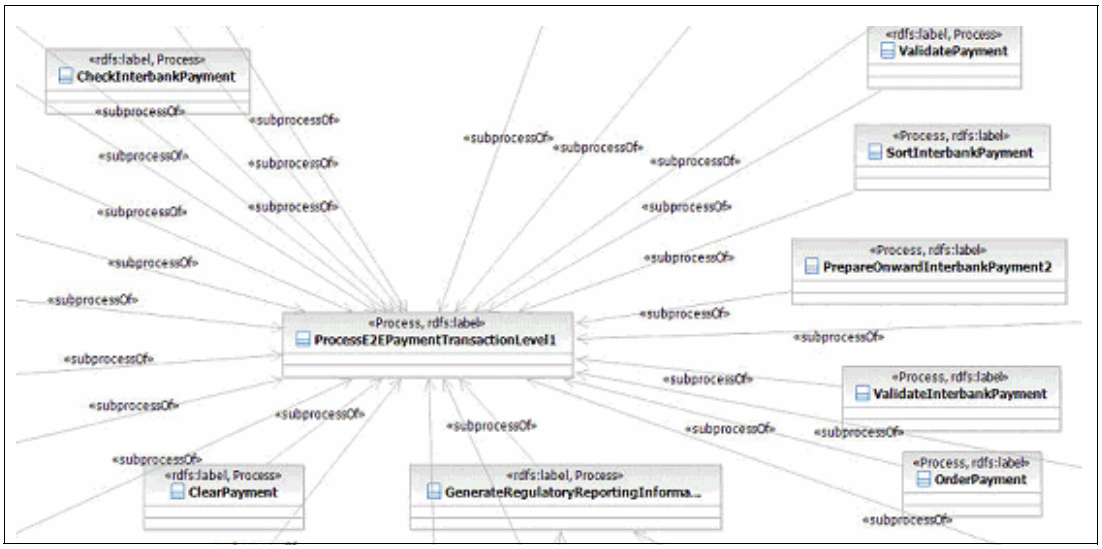

Figure 6-6 Banking payment capability and process map

6.3.3 Modeling support

In the following ways, WebSphere Business Services Fabric has streamlined the modeling support for Industry Business Glossary:

- Usability:
  - The WebSphere Business Services Fabric modeling tool is now more seamless with content editing.
  - The WebSphere Business Services Fabric modeling tool generates only relevant concepts as part of Industry Business Glossary, resulting in faster product startup.
  - Labels and comments from the source model are carried over into Industry Business Glossary, loaded, and made available in WebSphere Business Services Fabric.
- Efficiency:
  - You can define industry concepts using fewer steps to convert industry terms to Industry Business Glossary terms.
  - You can use industry dictionaries, such as eEG7 SMILe, ISO20022, and HL7 Vocabulary, that contain numerous industry terms that are defined as concepts, properties, and their relationships.
- Reliability

  You can preserve descriptions and comments about business terms from the source models.

6.4 Enable agility with business service policies

Drive process changes using business service policies and avoid costly coding changes

WebSphere Business Services Fabric abstracts the logic of how services are assembled and contextualized out of business processes and puts it into metadata and policies. A *business service policy* represents how the business intends the business process and services to operate in a given business context or scenario. You can accelerate your ability to act on dynamic process changes by abstracting this type of logic into metadata and business service policies that are centrally stored and managed.

Traditionally, making changes to business processes and services required changing code, which often required a lengthy and costly redeployment cycle. With WebSphere Business Services Fabric, you can drive process changes using business service policies, avoiding costly coding changes. You can also manage the life cycle of business service policies, making business service policy changes quickly while completely controlling and visualizing those changes, simulating them, and creating business service policy programming models and expressions.

6.4.1 Business service policy simulation

WebSphere Business Services Fabric includes an environment on which you can simulate how the runtime environment selects the best business service variation based on the operating context. You can model your business service policies and run a simulation immediately to see how the runtime environment enforces these business service policies, which is a key advantage of the WebSphere Business Services Fabric declarative approach. Simulation can be done before committing the policies to the BSR, which means that changes can be tested in isolation before they are worked into the governance policy. Conversely, in an imperative programming approach, you must write code that specifies how business service policies are enforced, which results in longer testing cycles, because the code has to be compiled and deployed to a runtime environment before it can be tested.

With WebSphere Business Services Fabric, you can save, share, and reuse your simulations, which means that you can build test harnesses of simulations that you can quickly rerun to validate and verify the changes that were made to the business service policies. Figure 6-7 shows a simulation being created.

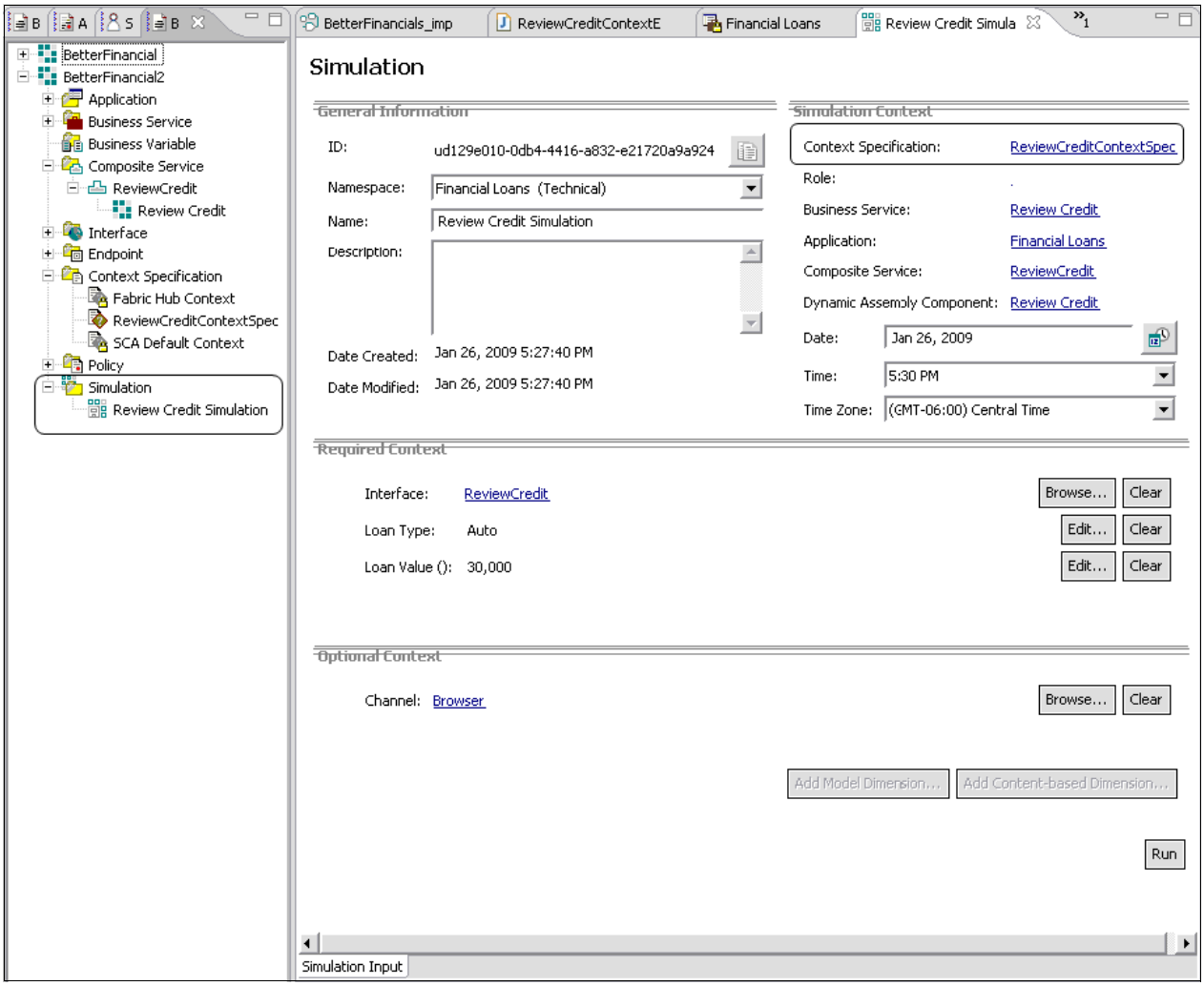

Figure 6-7 Creating a simulation

Simulations are automatically generated correct inputs that are based on the context specification that you defined, taking the guesswork out of defining the criteria used for a specific service-selection scenario. Simulation results provide more detailed information about the set of policies that are triggered for a given business context, the service endpoints considered, and the service endpoint selected. In the case of failure, the system displays the specific point at which the simulation failed and the reason for the failure, showing how the policies are enforced to determine the root causes of issues. Figure 6-8 shows simulation results.

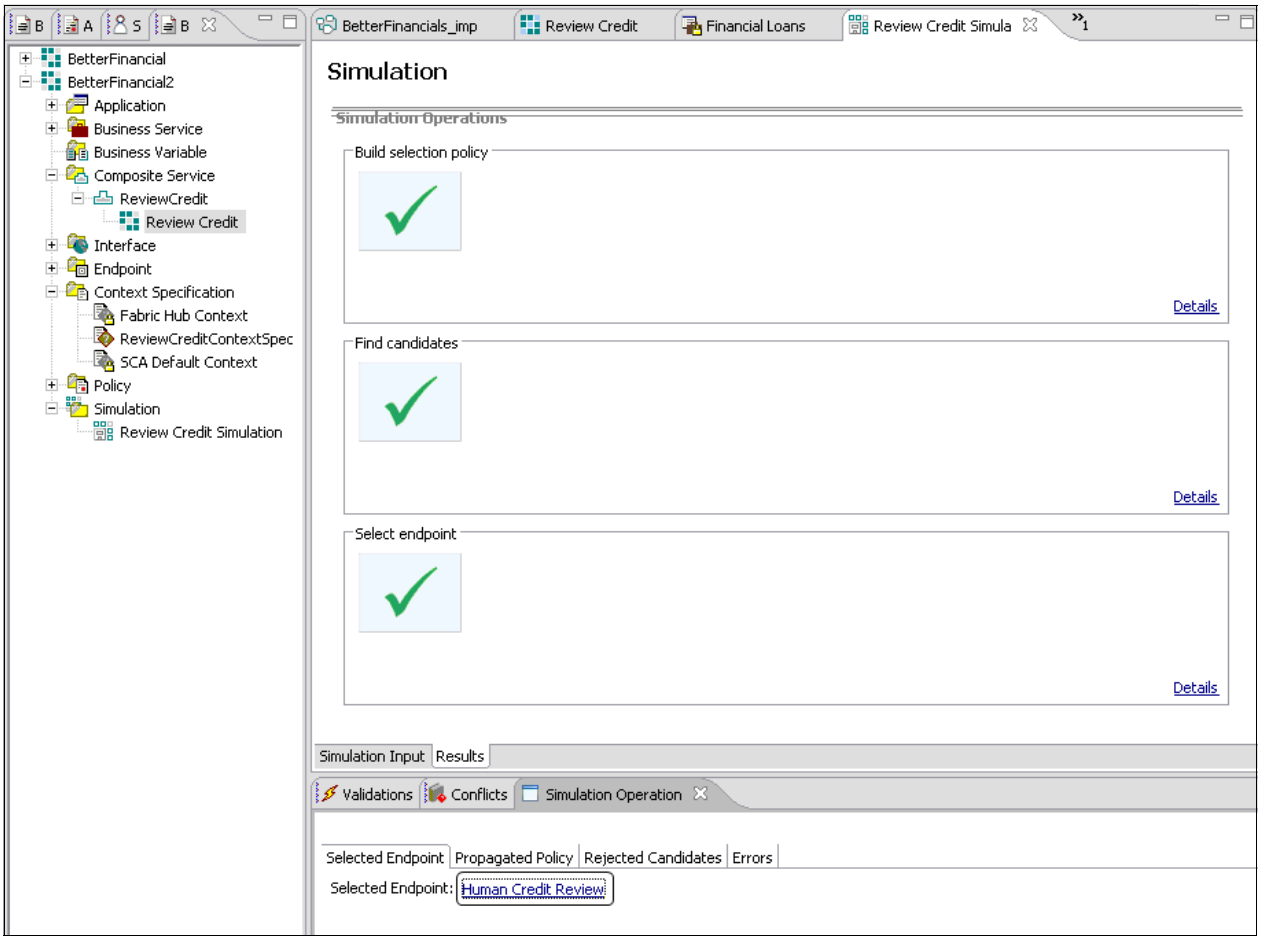

Figure 6-8 Simulation results

6.4.2 Programming business service policy modeling using context specifications

WebSphere Business Services Fabric significantly enhances productivity when building, testing, and deploying business service policies using context specifications. A context specification defines the set of dimensions required for a service-selection scenario and serves the following purposes, among others, in the business service policy life cycle (for example, customer type and amount assertions):

- Documenting key criteria that are used for evaluating business service policies to drive a service-selection scenario
- Serving as a contract between what was modeled and the runtime environment, ensuring that only the necessary dimensions or relevant business service policies for a business context are present at run time and are considered for a service-selection scenario and for evaluating business service policies
- Automatically generating the simulation user interface with correct selection criteria, ensuring that each service-selection scenario is properly tested
- Enhancing performance by allowing the runtime environment to employ smart caching strategies

Figure 6-9 shows the context specification editor and simulation user interface with selection criteria automatically generated based on the context specifications.

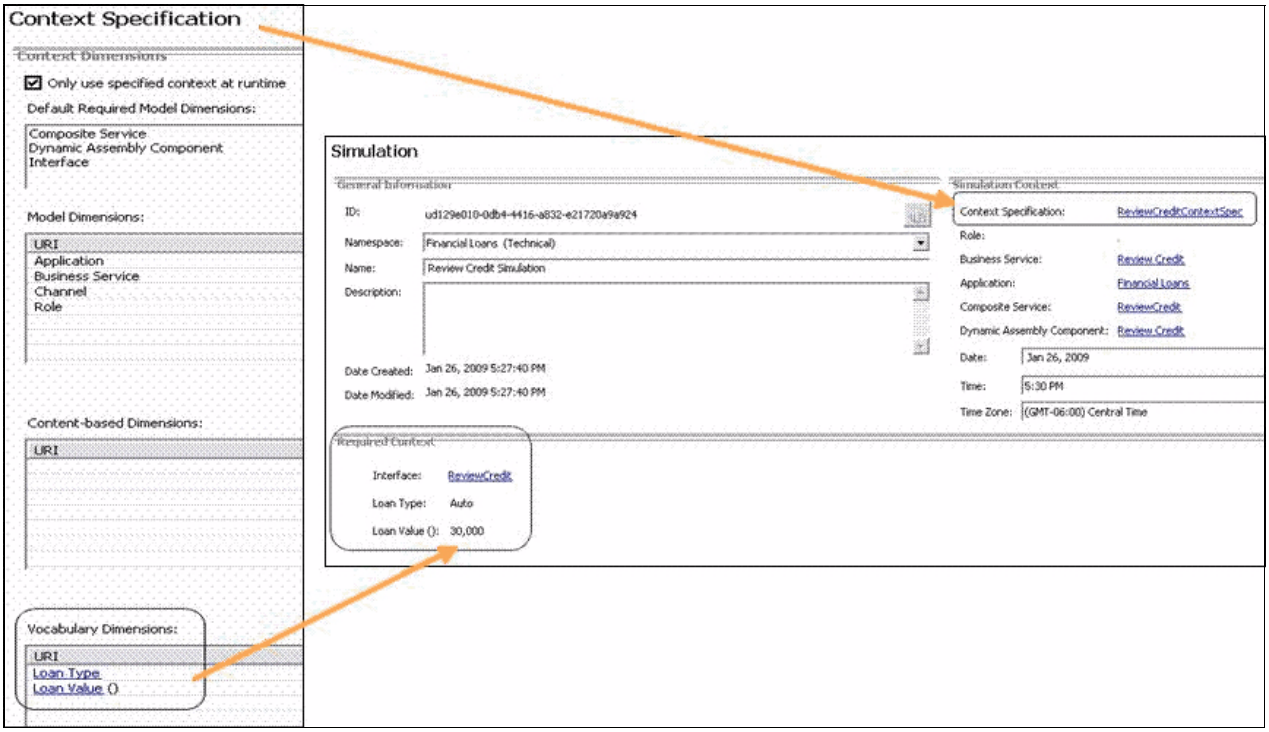

Figure 6-9 Context specification editor and simulation user interface showing selection criteria

6.4.3 Expressive business service policy power

A key advantage of WebSphere Business Services Fabric is that the runtime environment understands the modeled business service policies. Unless you are using the context extraction component, you do not have to write code to enforce the semantics of the service-selection business service policies when you extract content and insert it into the context; the semantics are enforced exactly the same way as how you modeled and simulated them in Composition Studio. WebSphere Business Services Fabric includes assertions, comparators, and operators that you can immediately incorporate into your modeling business service policies.

As part of the Industry Content Packs, 56 domain-specific assertions are available that help you model a broader range of service-selection scenarios. In addition, capabilities have been added for dealing with numerous business service policy dimensions that use set-based comparators and regular expressions for complex string-based comparisons.

6.4.4 Authoring business applications

A composite business application represents the flow of a process from one business service to another (shown in Figure 6-10). It allows a business user to quickly visualize the role of a business service in a given business process and provides meaningful scoping for business service policies.

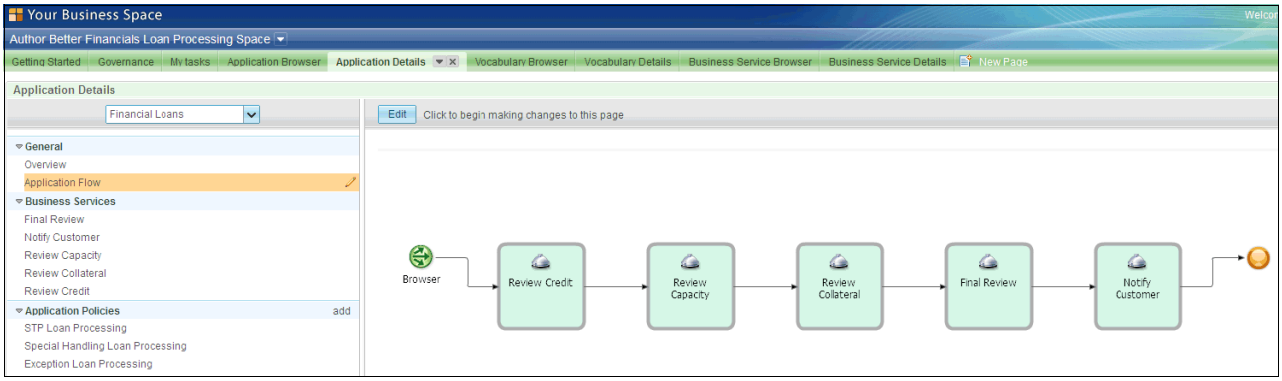

Figure 6-10 A composite business application showing a single browser channel input and a series of business services

Business services have at least one implementation, which is called a *process variation*. A process variation can involve a human-centric process, a fully automated process, or a callout to an outsourced service. A business service represents a business decision point that uses policies to determine which variation to use, embodying an important value that the WebSphere Business Service Fabric delivers: the ability to modify existing variations or deploy new variations without modifying or redeploying the existing application.

6.4.5 Authoring business service policies

There are two tools for authoring business service policies: Composition Studio is available for IT users to create technical policies and business spaces are available for business users to create business service policies. Technical policies are isolated from business policies, and the Dynamic Assembly components that are not CBA-enabled cannot access the business policies. Components that are CBA-enabled can access both the business and technical policies.

6.5 Web-based authoring

Business users can author business service policies in business spaces using the three templates of the WebSphere Business Services Fabric authoring widgets. The Fabric Administrative template provides the governance capabilities for managing access to the artifacts in the repository. In previous releases, this ability was available only in the Fabric Administrative Console. The Business Process Agility template supports changes to business service policies and business variables without IT intervention. The Fabric Authoring template helps you create applications, business services, vocabularies, and business service policies.

Using these widgets, you can demonstrate WebSphere Business Services Fabric technology that is not only tied to the IT professional, but available to the business user, improving the integration of WebSphere Business Services Fabric into the end-to-end BPM story.

6.5.1 Authoring vocabulary

Terminology that is tailored for a business is important to facilitate a productive business-IT alignment. A *business vocabulary* describes a business domain that is composed of concepts and relationships. Vocabularies can be reused and extended, and a business application can rely on concepts that are drawn from several different vocabularies. WebSphere Business Services Fabric ships with a core BPM Vocabulary that defines some basic concepts

including role, channel, and the “has” relationship type. This basic vocabulary can be expanded by using the Fabric widgets in a business space.

A *vocabulary* is used to extend the terminology of business context and policies. The vocabulary-building capabilities in a business space replace the need to model content-based assertions. New vocabularies can be created to capture business domain knowledge, such as domain-specific business concepts, definitions, and relationship types. New roles and channels can also be added to a vocabulary. These concepts can span business services. Figure 6-11 shows the wizard for creating a new channel in a business space. The user is required to select an existing change set or create a new one.

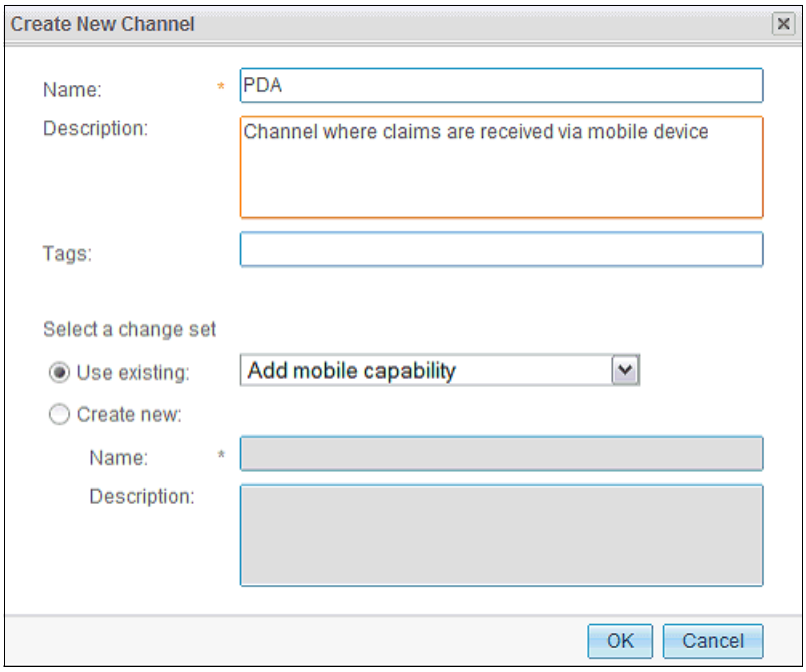

Figure 6-11 Creating a new channel in a business space using WebSphere Business Services Fabric authoring widgets

A *business concept* is a basic element of the vocabulary that can be used as a building block of a business service policy. It can be a simple type, such as a date, integer, or text, or it can be a complex object and represent the input, output, or both of a service request. The type definition determines the control, value range constraints, and comparators that are available when authoring policies.

Figure 6-12 shows the wizard that is used to create a complex business concept called Mortgage Application. Complex objects are composed by creating “has” relationships between the complex object and its constituent parts. In Mortgage Application, under Relationships, you can see many “has” relationships to other business concepts along with the cardinality of the relationship.

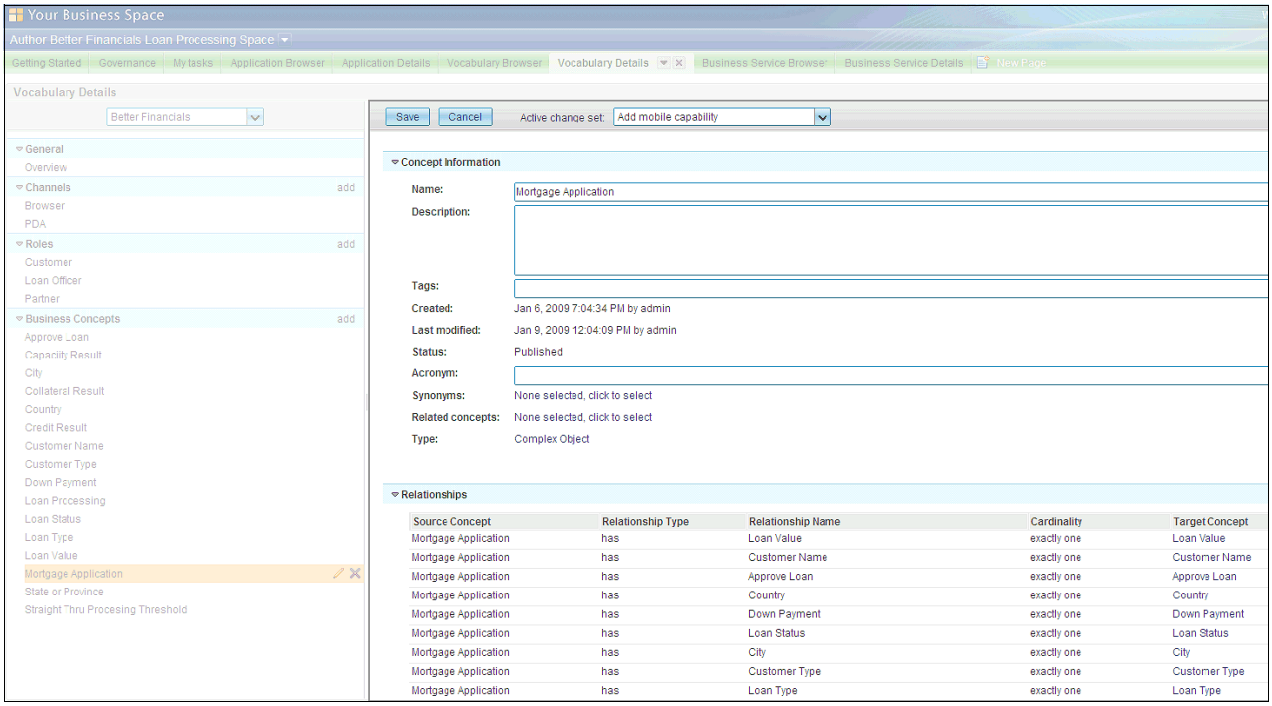

Figure 6-12 Wizard used for creating a complex business concept

When authoring business service policies, the vocabulary that is available for creating conditions is based on the inputs of the business services that are involved. For example, the Mortgage Application business concept from Figure 6-12 will be defined as the input and output of the Final Review business service, shown in Figure 6-13.

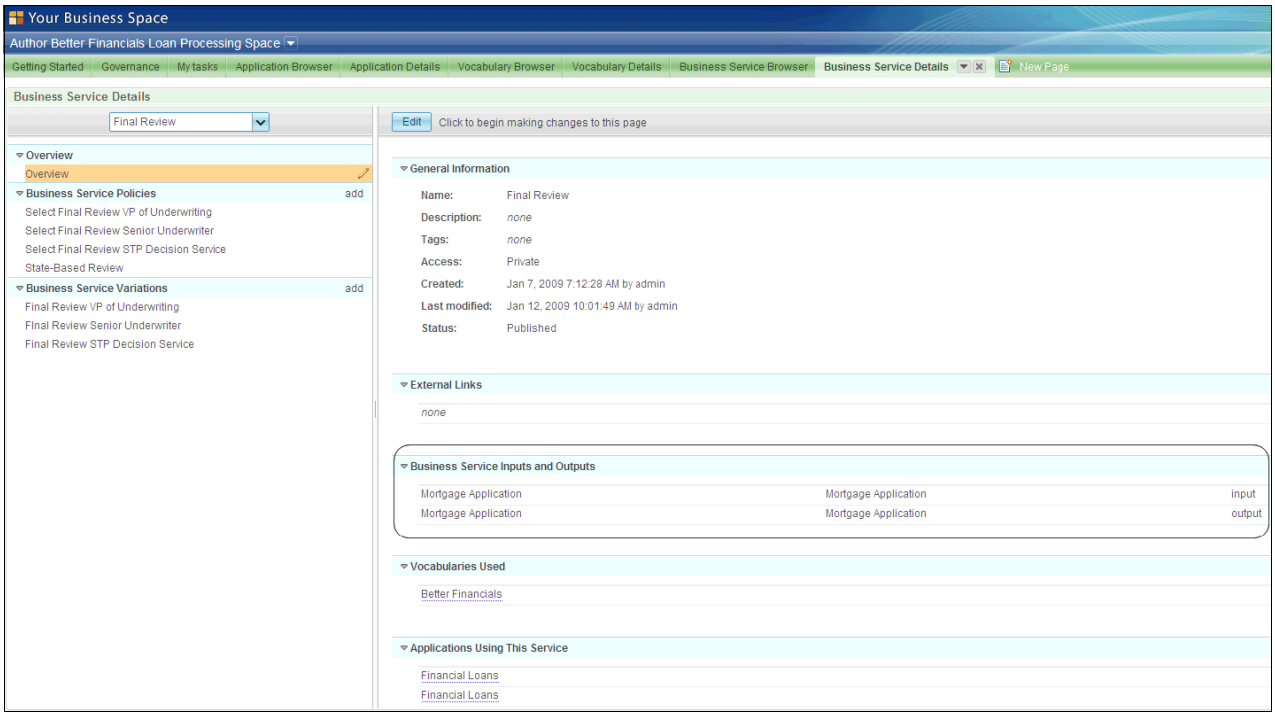

Figure 6-13 The Final Review business service has a defined input and output to the Mortgage Application business concept

To write business service policies in a business space, define new vocabulary concepts that represent business parameters, and then create policies that attach values to these parameters for specific circumstances.

The business service policy model follows the For-When-Then syntax. The For clause represents a business service or application. The When clause represents a condition; it must be true for a business service policy to apply. It supports complex expressions using AND, OR, or NOT and vocabulary-based conditions (shown in Figure 6-14).

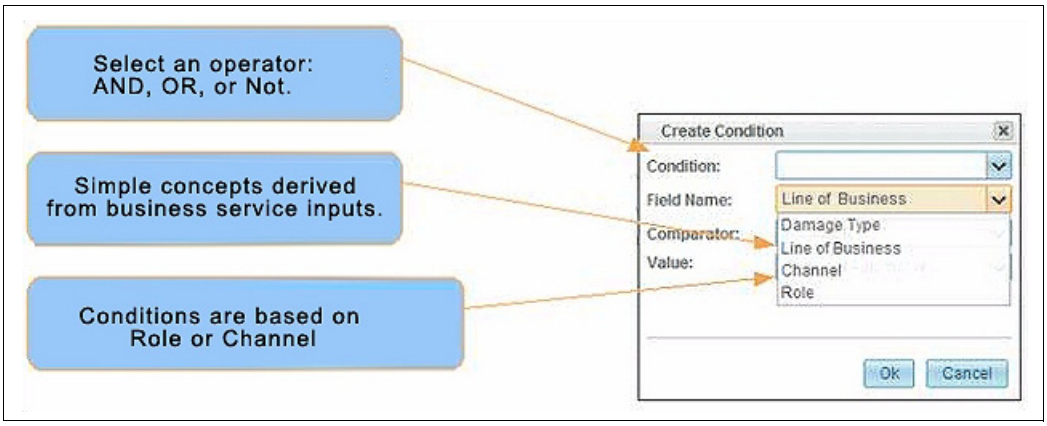

Figure 6-14 The When clause of a business service policy uses complex expressions and vocabulary

The Then clause, shown in Figure 6-15, can have two results: select a variation (business service implementation) or establish context by assigning a value to a business concept.

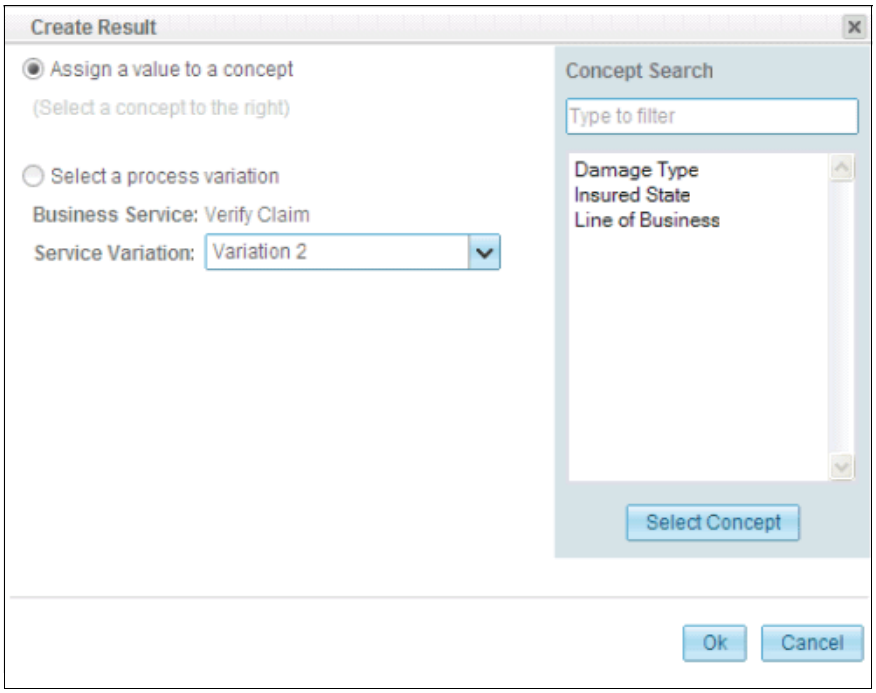

Figure 6-15 The Then clause of a business service policy can assign a value to a business concept

6.6 Integrated and aligned with the WebSphere BPM portfolio

WebSphere Business Services Fabric is better integrated and aligned with other capabilities in WebSphere Dynamic Process Edition, allowing it to be leveraged as part of a larger BPM-based solution.

6.6.1 Programming model alignment

WebSphere Business Services Fabric leverages the same Service Component Architecture (SCA)-based programming model as the other products in the BPM portfolio, enabling you to create business services. Figure 6-16 shows the WebSphere Business Services Fabric runtime component exposed as an SCA component that can be leveraged along with other BPM runtime capabilities that are exposed as SCA components to build solutions.

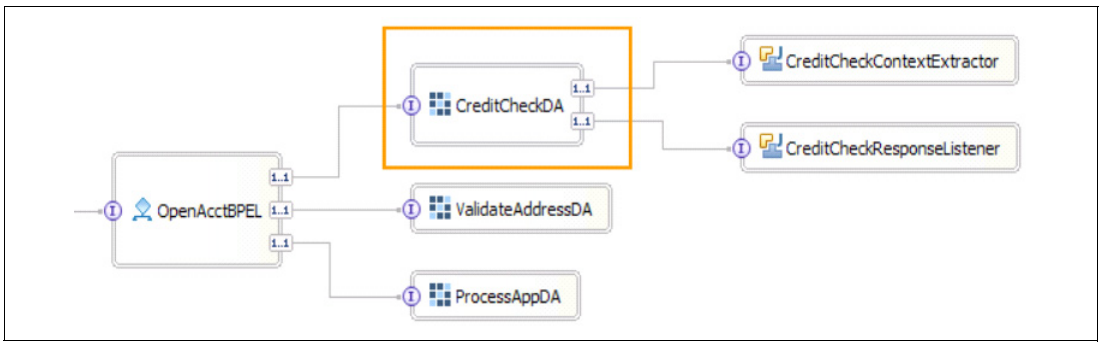

Figure 6-16 WebSphere Business Services Fabric leverages an SCA-based programming model

6.6.2 Integration with WebSphere Business Modeler

Using WebSphere Business Modeler, the business analyst can import composite business applications, services, and vocabularies that have been defined using the Fabric widgets in a business space. The business analyst can then further define the resulting model elements and export them to the integration developer who uses WebSphere Business Services Fabric as a runtime environment.

WebSphere Business Modeler integrates with WebSphere Business Services Fabric so that the business analyst can model and implement business service policy-driven processes. When they are instantiated, the business service policies that drive these processes can be updated without requiring the process implementation itself to be changed, allowing for quicker and more flexible updates to the process flow.

Models intended for implementation in WebSphere Business Services Fabric can be completely designed using WebSphere Business Modeler, but a more complete development process is to perform the following tasks:

- A technical business analyst imports the information from the repository into WebSphere Business Modeler, which creates global processes, services, business objects, and roles.
- The technical business analyst continues to refine the model, fully defining the processes that are associated with each service, or creating new ones.
- The technical business analyst then uses the WebSphere Integration Developer export to make the model information available to the developers who implement the processes in WebSphere Business Services Fabric. Any service that is related to a process becomes the interface of that process.

6.6.3 Integration with WebSphere Business Monitor

The WebSphere Business Services Fabric generates several Common Base Events that can be monitored using WebSphere Business Monitor. By monitoring the WebSphere Business Services Fabric-generated Common Base Events, custom Key Performance Indicators (KPIs) can be created to provide useful data about business decisions made using WebSphere Business Services Fabric.

Table 6-1 describes the WebSphere Business Services Fabric events that are related to SCA component information, selection policies, context, and the success or failure status.

Table 6-1 WebSphere Business Services Fabric events related to SCA component information

Event	Description
Context Extraction Event	This event is fired whenever the Dynamic Assembler processes a context extractor. It captures the current and parent contexts.
Dynamic Selection Event	This event is fired on every successful service invocation. The event captures details about the dynamic selection of an endpoint, such as endpoint ID and address.
Endpoint Not Available Event	This event is fired when the selected endpoint is not available at the time the request is made, for example, the selected endpoint is not available at the specified hours of operation. This event captures information about the resulting error.
No Endpoint For Policy Event	This event is fired when the Dynamic Assembler does not find endpoints that match the criteria in the policies. This event captures information about the resulting error.
Technical Error Event	This event is fired when a plug-in, such as a Context Extraction or Policy Guard, fails. This event captures information about the resulting error.

6.7 Summary

Companies need flexible solutions to support change in an environment of increasing process complexity. Composite business applications, which are assembled from business services, can meet these needs by dynamically adapting business functionality based on changing business context and business service policies. Additionally, by storing business service policies in one centralized location to govern the behavior of business services, you can more easily change and maintain processes and perform impact analysis. WebSphere Business Services Fabric broadens the BPM-enabled SOA approach to achieve these benefits while offering optional Industry Content Packs to accelerate the deployment of industry-specific composite business applications.

Related publications

The publications listed in this section are considered particularly suitable for a more detailed discussion of the topics covered in this paper.

IBM Redbooks publications

For information about ordering these publications, see “How to get IBM Redbooks publications” on page 132. Note that some of the documents referenced here might be available in softcopy only:

- *WebSphere Business Process Management V6.1.2 Production Topologies*, SG24-7665
- *Getting Started with IBM WebSphere Business Services Fabric V6.1*, SG24-7614
- *Getting Started with IBM WebSphere Process Server and IBM WebSphere Enterprise Service Bus Part 2: Scenario*, SG24-7642
- *z/OS: WebSphere Business Process Management V6.1.2 Production Topologies*, SG24-7703
- *WebSphere MQ Workflow Transition to WebSphere Process Server*, SG24-7282
- *Business Activity Monitoring with WebSphere Business Monitor V6.1*, SG24-7638
- *Business Process Management: Modeling through Monitoring Using WebSphere V6.0.2 Products*, SG24-7148
- *Getting Started with IBM WebSphere Process Server and IBM WebSphere Enterprise Service Bus Part 1: Development*, SG24-7608
- *Getting Started with IBM WebSphere Process Server and IBM WebSphere Enterprise Service Bus Part 2: Scenario,* SG24-7642
- *Getting Started with IBM WebSphere Process Server and IBM WebSphere Enterprise Service Bus Part 3: Run time*, SG24-7643
- *Aligning Business Process Management, Service-Oriented Architecture, and Lean Six Sigma for Real Business Results*, REDP-4447
- *Business Process Management Enabled by SOA*, REDP-4495
- *Building Green IT Solutions Using IBM Smart SOA: Business Process Management and Resource Optimization*, REDP-4519
- *IBM WebSphere Process Server Best Practices in Error Prevention Strategies and Solution Recovery*, REDP-4466

Other publications

These publications are also relevant as further information sources:

- *Business Process Management: Practical Guidelines to Successful Implementations,* ISBN-13: 9780750686563

Online resources

These Web sites are also relevant as further information sources:

- WebSphere Business Process Management

  http://www.ibm.com/software/websphere/products/businessint/

- Business Process Management Powered By Smart SOA

  http://www.ibm.com/software/info/bpm/

- IBM SOA Business Catalog home page

  http://www.ibm.com/software/brandcatalog/portal/soa?S_TACT=1O6AB27W&S_CMP=soaswcatalog

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IBM Business Process Management Reviewer's Guide

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Optimize costs and drive business agility

Market demand for business process management (BPM) has grown significantly in recent years and shows no sign of abating. Based on consultations with our clients, a set of capabilities that IBM makes available enables you to build robust and holistic BPM solutions, whether they are integration-centric, human-centric, or content-centric.

In this IBM Redpaper publication, we provide an overview of the IBM BPM portfolio to BPM market watchers who have a keen interest in understanding the most current BPM technology releases and how they can be used together. Specifically, we review the key benefits and capabilities of the WebSphere Dynamic Process Edition of the IBM BPM Suite.

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